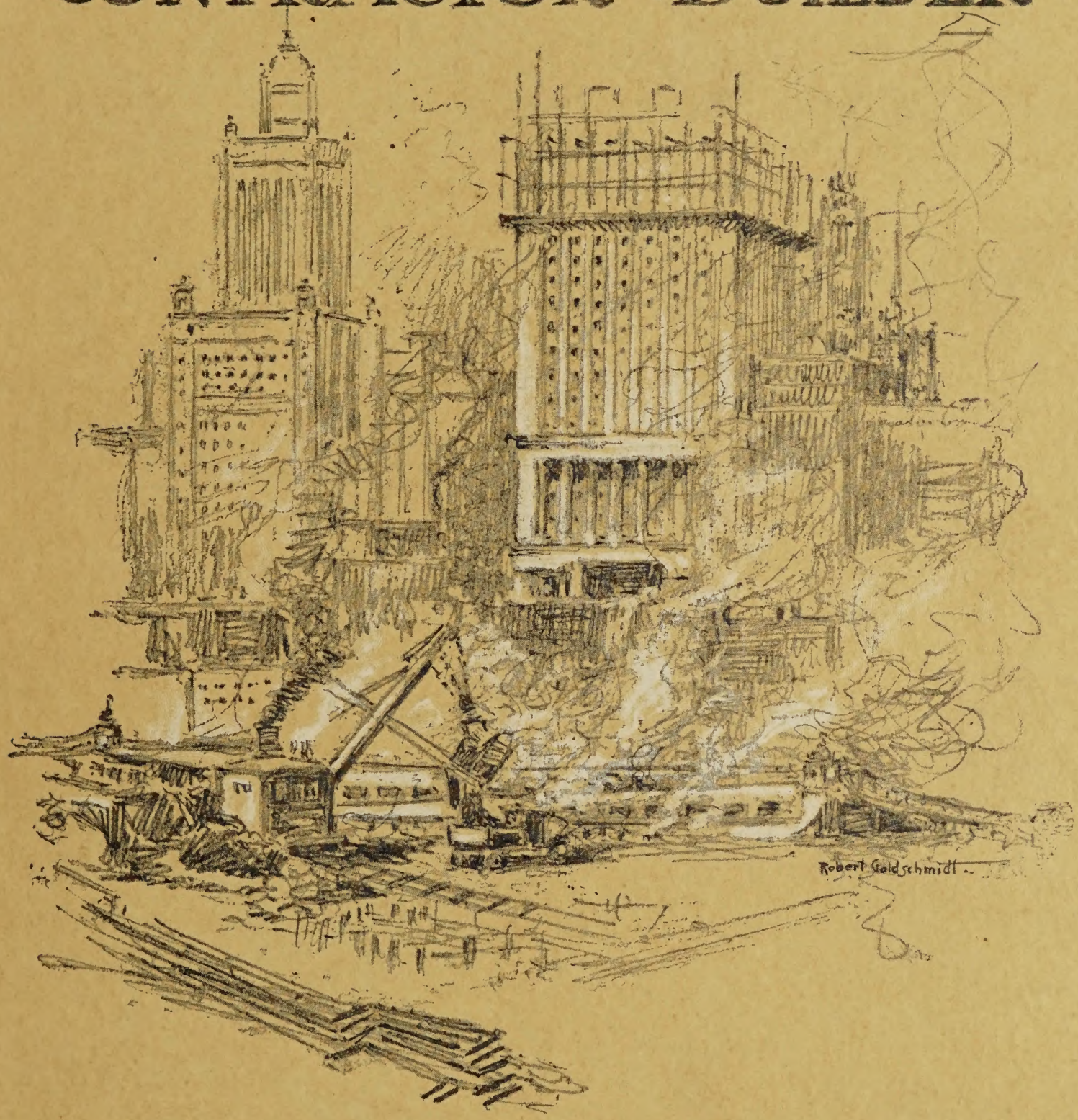
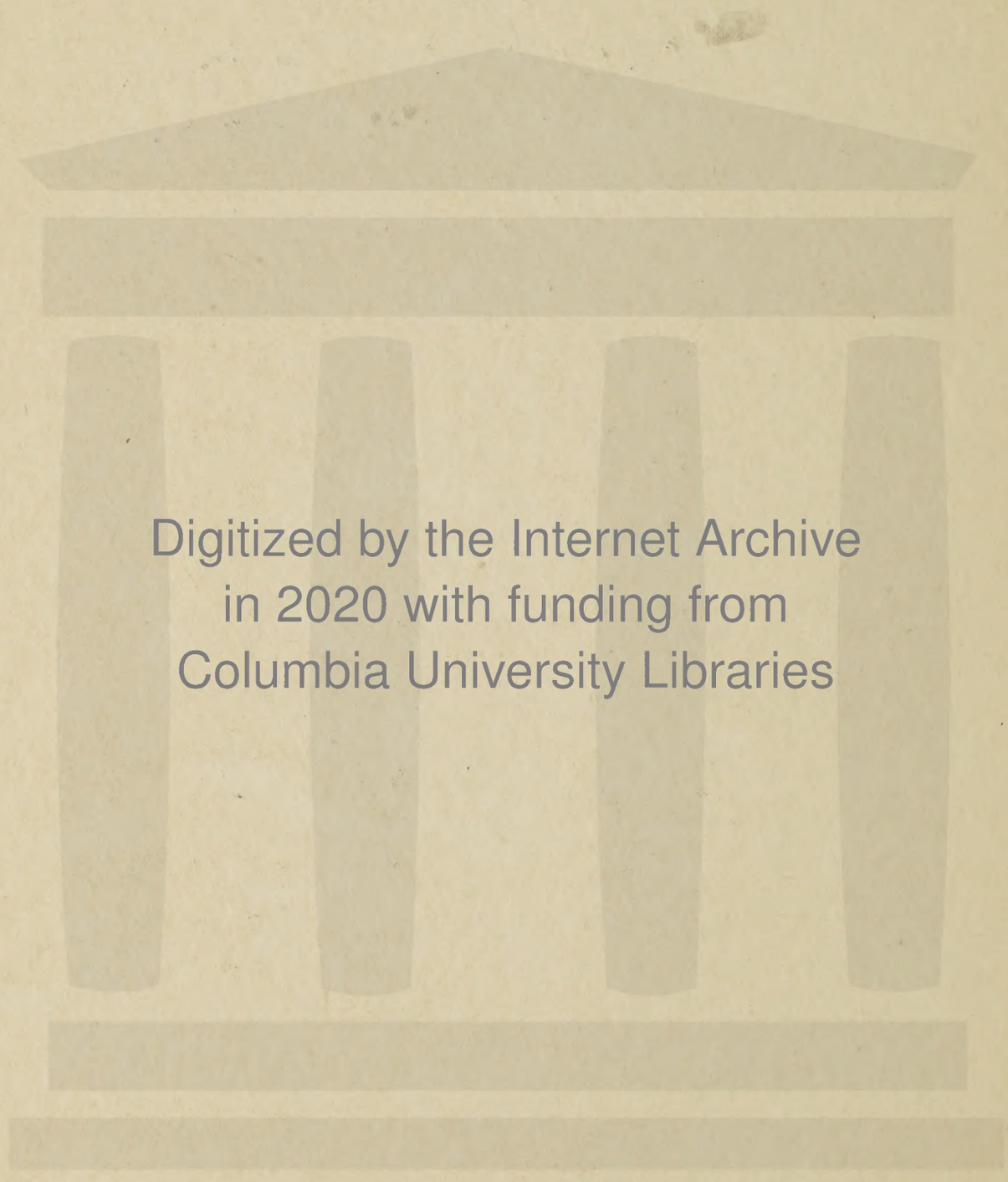
STEEL PRODUCTS
for
CONTRACTOR & BUILDER



JOSEPH T. RYERSON & SON INC.

ESTABLISHED 1842

CHICAGO MILWAUKEE ST. LOUIS CINCINNATI DETROIT
CLEVELAND BOSTON BUFFALO NEW YORK



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Ryerson
In Unique Position to Serve Contractors and Builders

Reinforcing Steel plus a broad General Service on all Steel Products

FOR eighty-four years we have been furnishing all iron and steel products to builders and manufacturers. A few years ago a special department for serving the contractor and builder was established.

This department has its own warehouses and provides complete service on all reinforcing for concrete, including bars, spirals, triangle mesh and electric welded fabric, etc. Steel joist, expanded metal, metal lath and steel sash are also included.

All types of jobs are figured and lump sum or pound price quotations are prepared.

Backing up this large and important division of our business are General Steel Departments, furnishing structurals, bars, plates, sheets, rivets, bolts, wire, etc. The Machinery and Small Tool groups complete the service.

The co-operation of these other departments with the Reinforcing Steel Division forms a complete steel building product and tool service for the contractor, which is unique and unparalleled by any firm in the country.

It means that the contractor uses the large Ryerson warehouses as though they were his own. He keeps his reinforcing steel, lath, sash as well as other miscellaneous materials under cover in the Ryerson warehouses until he is ready to use each item, which comes to him in time to meet the production schedule.

As contractors and builders are not usually in a position to stock their own material, this complete service is of particular value.

JOSEPH T. RYERSON & SON INC.

PLANTS AT CHICAGO MILWAUKEE ST. LOUIS CINCINNATI DETROIT BOSTON CLEVELAND BUFFALO JERSEY CITY
REPRESENTATION IN DENVER LOUISVILLE SAN FRANCISCO MINNEAPOLIS TULSA HOUSTON LOS ANGELES NEWARK

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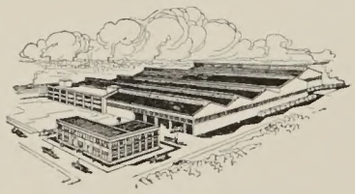
St. Louis

Chicago

Cincinnati

Jersey City



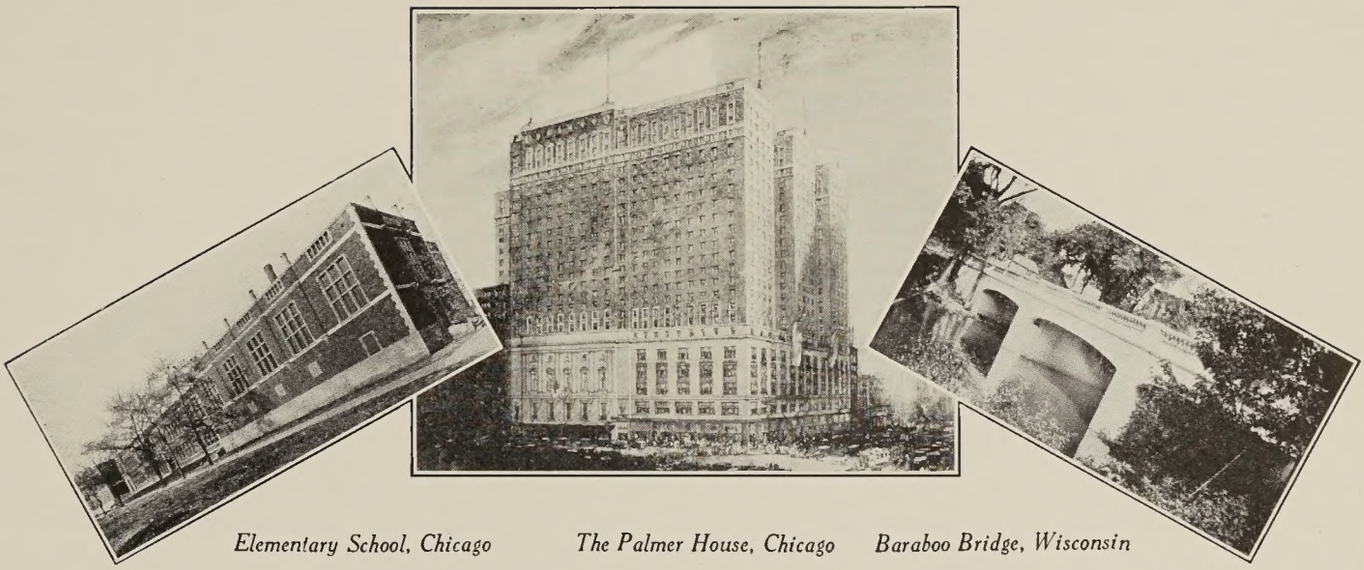
Detroit

Cleveland

Boston

Buffalo

There is a Ryerson Plant Near Your Job or Shop



Elementary School, Chicago *The Palmer House, Chicago* *Baraboo Bridge, Wisconsin*

Concrete Reinforcing Service

THE eight great steel-service plants, strategically located within the various industrial centers, always carry in stock thousands of tons of new billet steel reinforcing, ready to serve all sections of the country. The most up to date machinery and other equipment quickly bends the material to shape. Spirals of either hot rolled wire rod or cold drawn wire, in diameters from eight inches up to seventy-two inches or even larger if desired, are formed by special power equipment.

Beam, joist and slab bar spacers, bar and screed chairs, tie chairs, etc., are always available for immediate shipment either with or without reinforcing bars.

Triangle wire mesh or electric welded fabric for reinforcing roadways and for floor slabs, concrete pipe, etc., is shipped out in any form or size required.

Metal road strip as used for longitudinal center joints of concrete roadways in Illinois is always in stock, together with sheet metal pins for holding the strip in position, and bar supports for keeping the reinforcing bars in their proper location in the roadway. Metal road strip of other widths and gauges than that used on Illinois highways can also be furnished.

Bending—Fabricating

The most up to date fabricating equipment enables us to bend bars to any shape on power benders, to form beam, joist and slab rods, stirrups, ties, and hoops, in the shortest possible time. Our spiral machines manufacture spirals for round columns, and continuous uniform hooping for square and rectangular columns, and for square or round concrete piles.

Special machines of our own design, operated by compressed air, form continuous stirrups of wire mesh; press the mesh into the form of step reinforcement, or into any other shape that may be desired. The mesh is cut from standard rolls of either triangle mesh or electric welded fabric, and straightened on electrically operated rolls before being put through the forming machines.

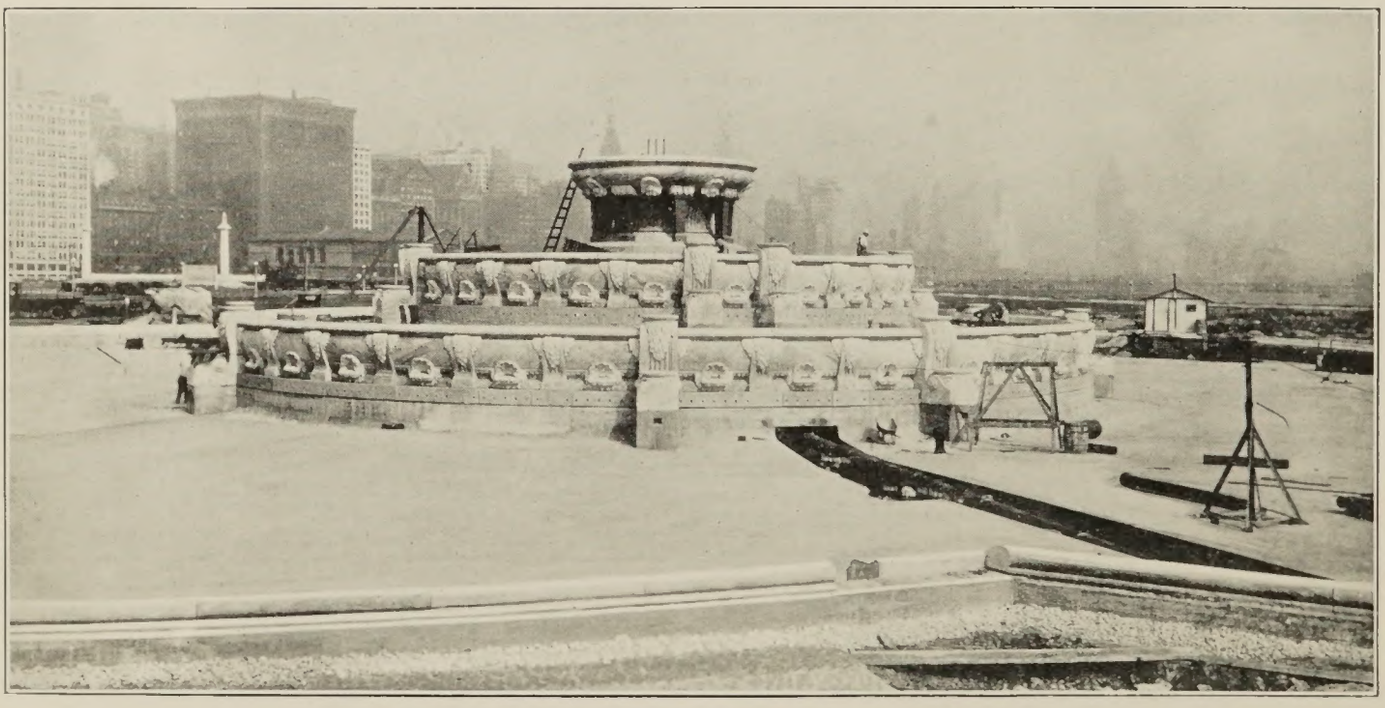
There is no job of bending or other reinforcement fabrication which we cannot turn out satisfactorily with our power equipment or by calling on our several blacksmith shops in cases where extraordinary bending is required. These shops and our electric welding equipment enable us to meet the special construction requirements of the contractor

Shop fabrication will not delay shipments more than a day or two and the purchaser is relieved of the expense and inconvenience of doing this work in the field. Storage space and the attendant handling and re-handling at the site is done away with, and the material as delivered is of proper dimensions—ready to be placed immediately in position in the structure.

Fleet of Steel-Service Trucks at One of the Ryerson Plants.

By systematic scheduling of all orders we are able to furnish and deliver material just as the contractor needs it—cut, bent, bundled, and tagged—ready for immediate installation. Special aluminum tags with stamped, raised letters and numerals which cannot be obliterated, show the location of each item in the building. These tags are not subject to rust.

Our extensive handling equipment, large fleets of trucks and private switch tracks connecting with trunk line railroads, enable us to render service which cannot be equalled by any other source of supply. When our ability to fill numerous other requirements of the contractor is taken advantage of and complete truck-loads of various commodities for the same destination are made up, or combined for shipment by freight, delivery charges and handling time can be reduced to a minimum. The customer can take advantage of a car-load freight rate on everything, instead of having to pay the less than carload freight on most items, as would be the case if he purchased the various materials from several different sources of supply.



The Buckingham Memorial Fountain, Grant Park, Chicago, Illinois.

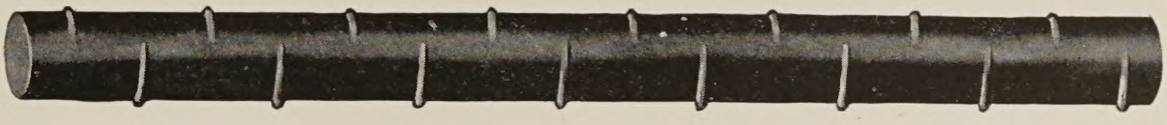
Reinforcing Bars in Stock

Deformed and Plain

AT ALL of our eight plants, located in Chicago, St. Louis, Cincinnati, Detroit, Cleveland, Buffalo, Boston and Jersey City we carry large stocks of reinforcing bars—both round and square, plain and deformed.

All Ryerson reinforcing bars are rolled from new billets, insuring the highest grade of material. This steel conforms to the standard specifications of the American Society for Testing Materials. Serial designation A-15-14.

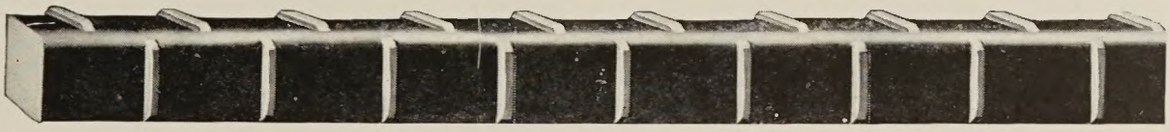
ROUND DEFORMED BARS



Size in Inches	Weight per Ft.	Area Sq. In.	Perimeter in In.	Net Extra for Size	Stock Lengths in Feet
*1/4	.167	.049	.785	1.00	20, 30, 40, 45
3/8	.376	.110	1.178	.40	20, 30, 40, 60
1/2	.668	.196	1.570	.20	20, 30, 40, 60
5/8	1.043	.306	1.963	.10	20, 30, 40, 60
3/4	1.502	.441	2.356	Base	20, 30, 40, 60
7/8	2.044	.601	2.748	Base	20, 30, 40, 60
1	2.670	.785	3.141	Base	20, 30, 40, 60

*1/4" size can be furnished only as plain round bars. Deformed bars of this size are not manufactured.

SQUARE DEFORMED BARS



Size in In.	Weight per Ft.	Area Sq. In.	Perimeter in In.	Net Extra for Size	Stock Lengths in Feet
1/2	0.850	0.250	2.000	.20	20, 30, 40, 60
1	3.400	1.000	4.000	Base	20, 30, 40, 60
1 1/8	4.303	1.265	4.500	Base	20, 30, 40, 60
1 1/4	5.313	1.562	5.000	Base	20, 30, 40, 60

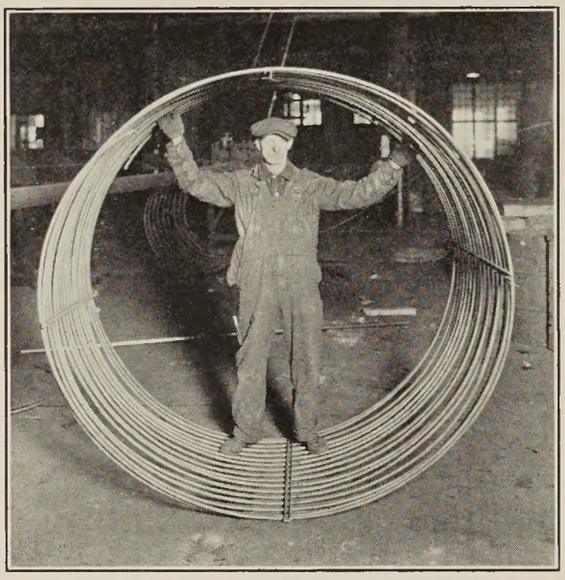
In ordering bent reinforcement, always give dimensions from outside to outside of bars.

In conformity with an agreement with the Bureau of Standards of the U. S. Department of Commerce to reduce waste in industry, the eleven sizes of reinforcing bars in the above tables are the only sizes sold by Joseph T. Ryerson & Son Inc., for reinforcing purposes. They can be furnished in plain bars as well as deformed, but stock lengths of plain bars vary at different plants. Always consult the Ryerson Journal and Stock List before ordering plain or deformed reinforcing bars.

Spirals and Continuous Hooping

THE use of spiral reinforcement for columns is shown by tests to greatly increase the ultimate strength and is used very extensively where the longitudinal reinforcement is arranged in circular form.

Unless otherwise ordered, we manufacture spirals from new, first quality, hot-rolled wire rod in sizes as shown in the Ryerson Journal and Stock List. Special light channel spacers are provided which permit the spiral to collapse for shipping purposes and still maintain the specified pitch. Two spacers on opposite sides are provided for all spirals of small diameter, but three and even four, are furnished for large spirals. The extra spacers are attached close to the customary two and worked around by hand to positions desired when spiral is extended for placing in the forms.



Special Machines make Spirals of any size.

As higher unit values can be used in figuring columns having uniform continuous hooping, it is now the practice in some sections of the country to use continuous hooping for both square and rectangular columns.

Tests will show that higher values can be used for the concrete cores of such columns than is possible where common ties are used. The simplicity of assembling the reinforcing in the forms where the hooping is continuous is readily apparent. This square hooping can be collapsed for shipment, in the same manner as round spirals.

Spirals of cold drawn wire can be furnished when especially ordered. Their cost is generally about ten dollars per ton higher than spirals made from hot rolled wire rod.

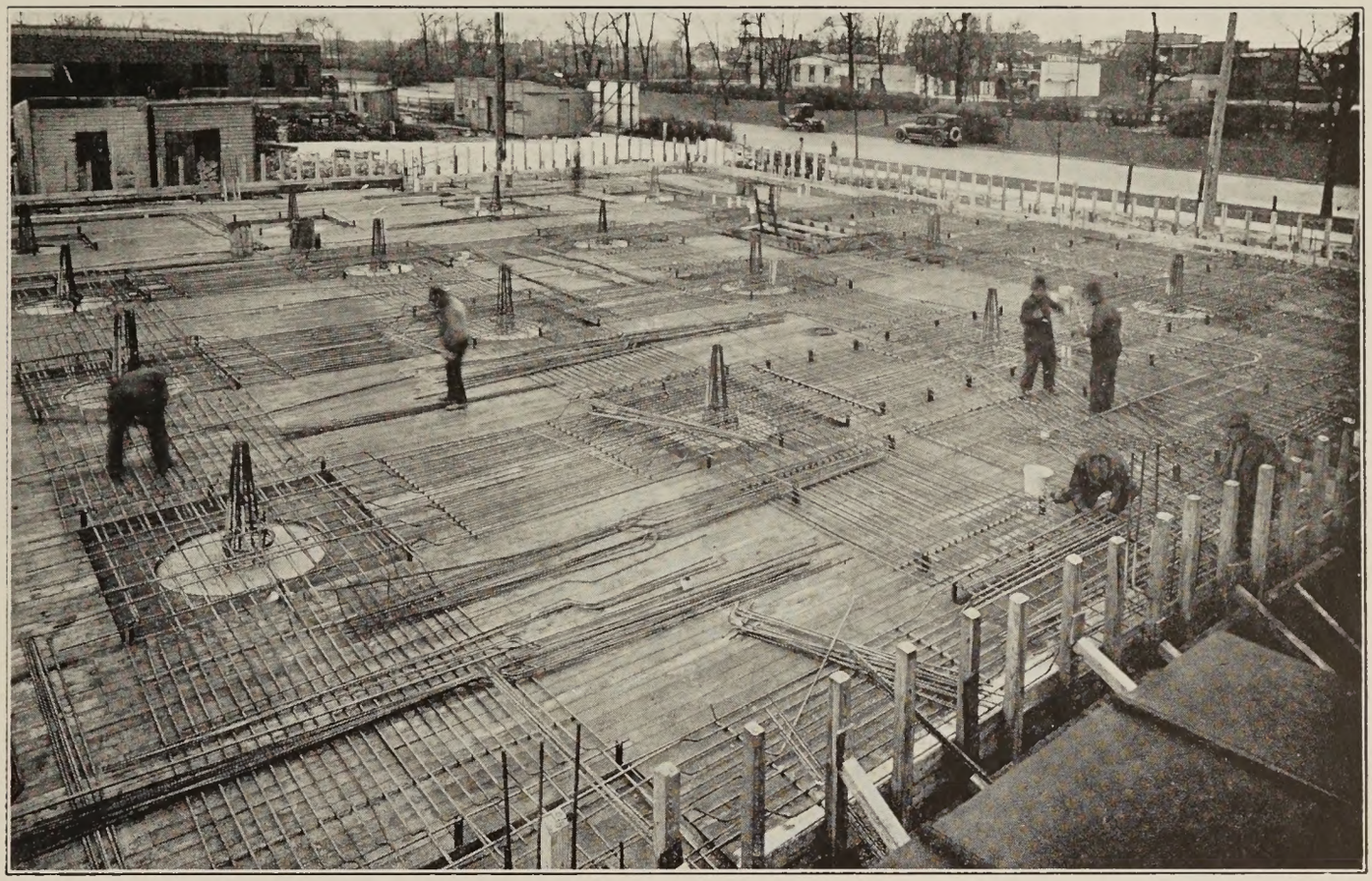
In accordance with an agreement with the Department of Commerce, Bureau of Standards, we together with other manufacturers of spirals, have agreed on a standardization of spiral manufacture as shown by the following table:

PITCH OF SPIRAL FOR VARIOUS PERCENTAGES OF ROD SIZES

Outside Diam.	Percentage of spiral (Hot-rolled Rod)																				
	¼-inch Round			⅜-inch Round							½-inch Round							⅝-inch Round			
D	½	¾	1	½	¾	1	1¼	1½	1¾	2	½	¾	1	1¼	1½	1¾	2	1	1½	1¾	2
10	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	...	...	1⅝	...	...	...	...	...	...	1⅞	...	...	...	...	...	...	...	...	...	...	...
16	2½	1⅞	...	...	...	...	2¼	1⅞	1⅝	...	...	...	...	...	...	...	2½	...	...	...	...
20	2	1½	...	...	...	2¼	1¾	1½	...	...	...	...	...	...	2¾	2¼	2	...	...	...	...
24	1⅝	...	...	...	2½	1⅞	1½	...	...	...	...	...	...	2⅝	2¼	1⅞	1⅝	...	...	3	2⅝
28	1⅜	...	...	...	2⅛	1⅝	...	...	...	...	...	...	2⅞	2¼	1⅞	1⅝	...	...	3	2½	2¼
32	...	...	...	2¾	1⅞	...	...	...	...	...	...	...	2½	2	1⅝	...	...	...	2⅝	2¼	2
36	...	...	...	2½	1⅝	...	...	...	...	...	...	3	2¼	1¾	1½	...	...	...	2¼	2	1¾
40	...	...	...	2¼	1½	...	...	...	...	...	...	2⅝	2	1⅝	...	...	...	...	2	1¾	1½

Limits: Pitch not less than 1⅜″ for ¼″ rod.
Pitch not less than 1½″ for all others.
Pitch not greater than ⅙ of diameter.
Pitch not greater than 3 inches.

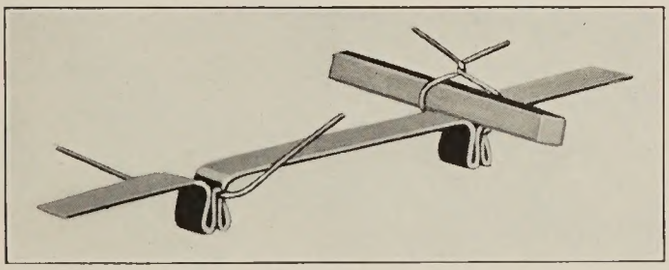
In ordering spirals give size of wire, outside diameter of core, pitch or distance center to center of wire, overall length of spiral, also the number of extra turns required, top and bottom. If information as to spacers is not given, our standard practice is to supply two spacers.



Typical Installation Showing Bar Spacers and Chairs in Place.

Bar Spacers, Bar Chairs and Bar Ties

SLAB bar spacers hold the bars the correct distance from the bottom of the form and from each other. They also tie every bar in its proper place.



Lower Slab Bar Spacer.

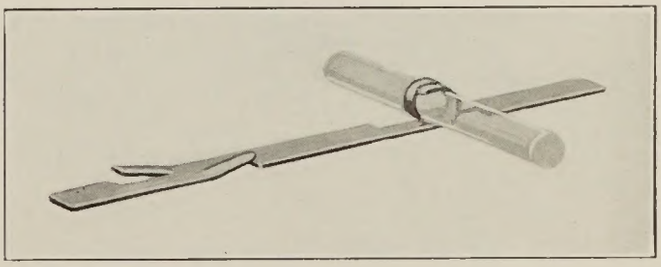
All spacers are made up to meet the exact conditions as provided for in the plans. They are tagged with designating marks to show the workmen exactly in what portion of the work they are to be used.

Wires at each tie point afford the quickest and best form of tie, as they hold each bar securely in the exact position desired, so that walking on the bars, and other abuse, to which they are often subjected will not dislodge them.

Beam bar spacers are provided with notches to hold the bars in the correct position in a beam. They are so constructed as to resist tipping over when the bars are pulled back and forth in the forms. When ordering, specify style desired, height, width of beam and number of bars in each layer.

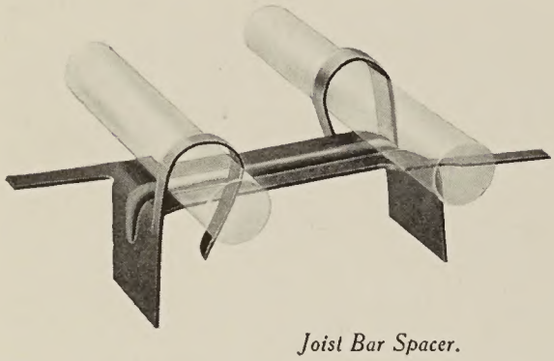
Bar spacers are furnished in two styles, one for the support and spacing of the lower bars in a beam, and the other to lay on top of the lower bars, to support the upper layer. The latter can be placed in position anywhere along the tops of the bottom bars.

Joist bar spacers are also furnished in two forms and

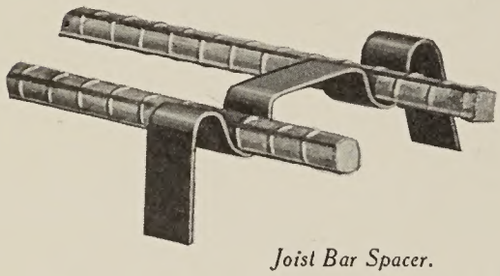


Upper Slab Bar Spacer.

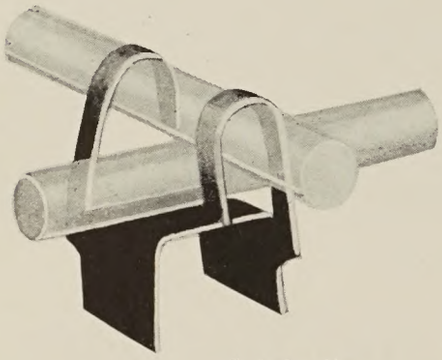
are adaptable to any type of ribbed floor construction. They are made to carry either one or two bars.



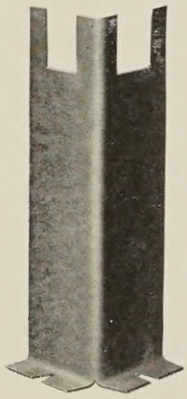
Joist Bar Spacer.



Joist Bar Spacer.

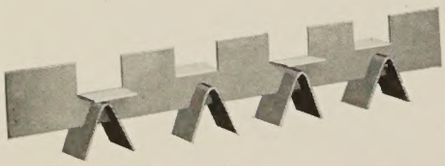


Rods Quickly Clamped in Place.

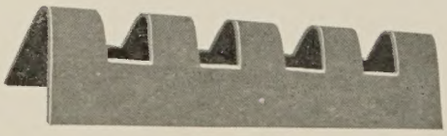


High Chair.

Bar Chair.



Lower Beam Bar Spacer.



Upper Beam Bar Spacer.

Bar Chairs

High chairs for supporting bars around column heads and top bars in direct belts of bars, have notches at the bottom to permit nailing the chair securely to the forms. High chairs are furnished of the exact height required for any type of construction.

A low type of bar chair as illustrated can also be furnished.

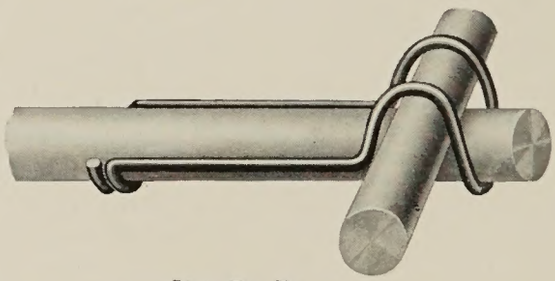
Screed Chairs

Screed chairs, of form similar to the high chairs, have an advantage over other devices for supporting screeds. They are nailed to the form by means of the notches at the bottom and thus are held firmly in place while the concrete is being poured. For the screed, a metal bar $\frac{5}{16}$ inches by 2 inches is used, resting in the top notches provided for it. After the screed is no longer required, the bar is removed, and leaves practically no depression in the slab as is the case when a thick wooden screed is used. The screed bars can be used over and over, while the chairs remain in the slab. From two to four chairs per screed are necessary, depending on its length.

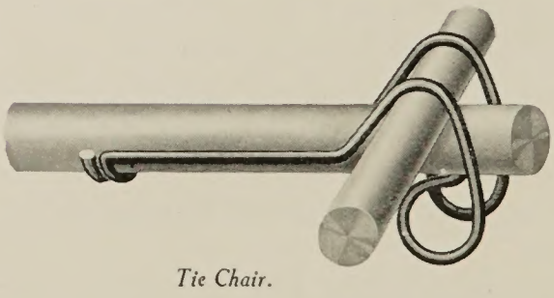
Bar Ties

Plain bar ties are suitable for tying together two intersecting bars. They are applied more quickly than any other form of bar ties. A day laborer can tie together at least twenty intersecting bars per minute.

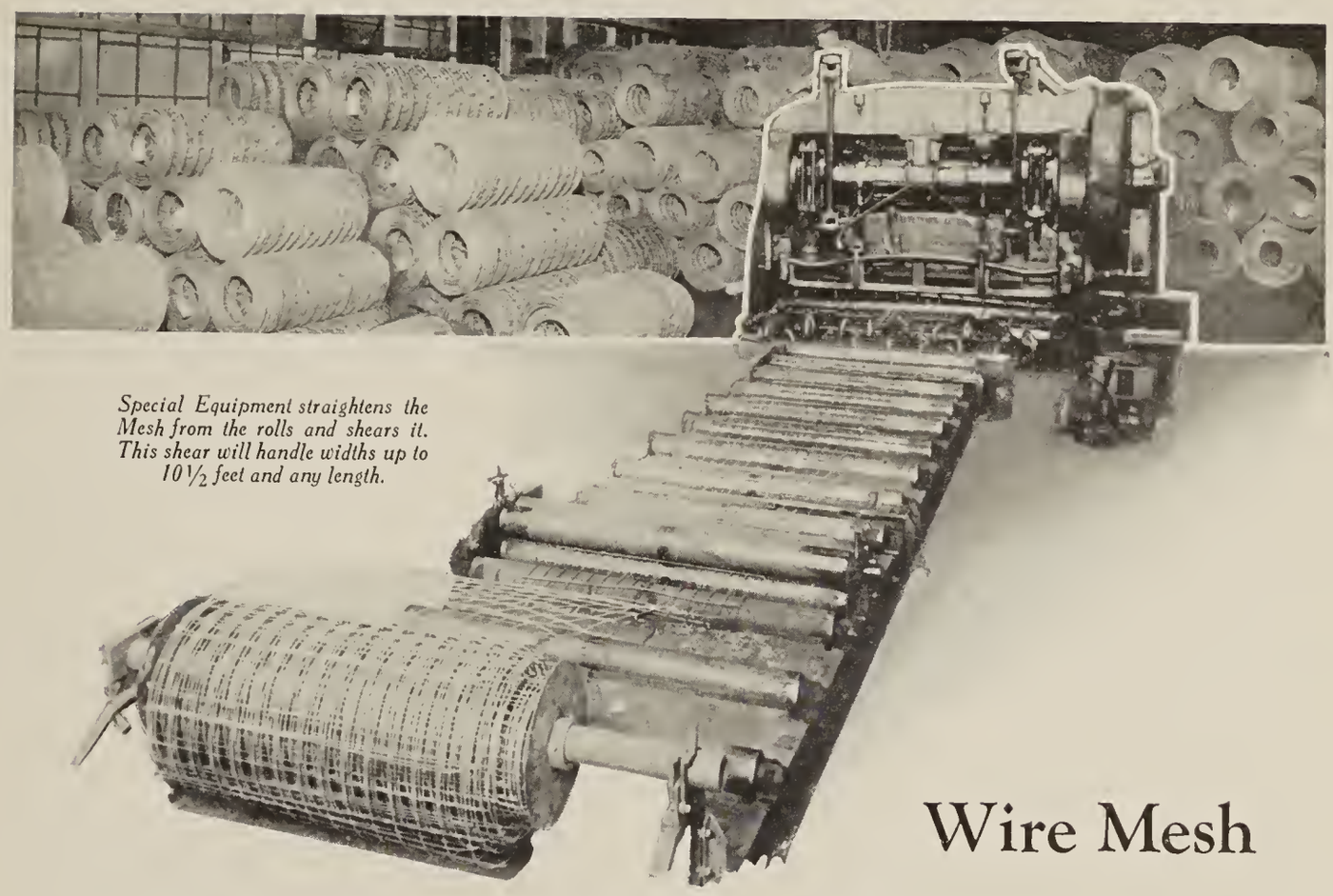
Tie chairs are made of high carbon spring wire. They lock the bars rigidly together and properly space them from the forms.



Plain Bar Tie.



Tie Chair.



Special Equipment straightens the Mesh from the rolls and shears it. This shear will handle widths up to 10½ feet and any length.

Wire Mesh

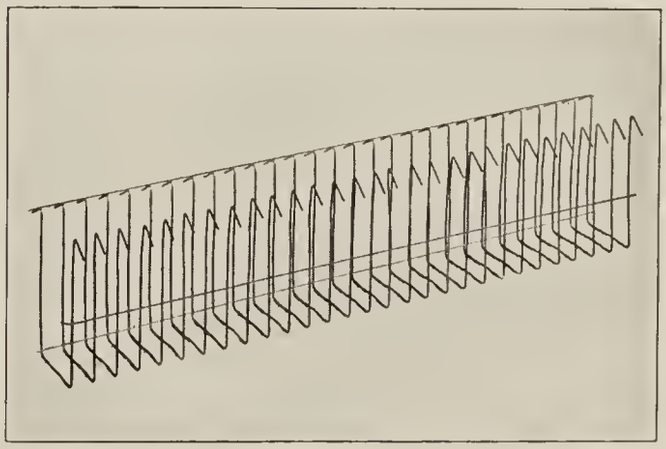
For Roads, Buildings and Special Uses

WE carry large stocks of Triangle Mesh Reinforcement and Electric Welded Fabric and can furnish this material for reinforcing roads and buildings, concrete pipe, concrete posts, concrete garbage receptacles, concrete burial vaults, concrete laundry trays, and for a multitude of other purposes.

Wire mesh is usually furnished in rolls of standard widths, but we are prepared to cut, straighten, and supply it in flat sheets, if desired.

Either plain or galvanized mesh can be shipped promptly. It is usually furnished in rolls either 150 or 300 feet long, as it is more easily stored and handled at the job in this form than in flat sheets and can be easily straightened with a set of portable rolls at the job. In cases where flat sheets are preferred we have special equipment in our warehouses which straighten and cut to any required length, so that the contractor has only to set the sheets in place.

We have developed machinery operated with compressed air which is capable of bending wire mesh to any form with straight uniform corners and edges. This enables us to supply pressed and formed material for any purpose at a great saving in cost over any previously known method.

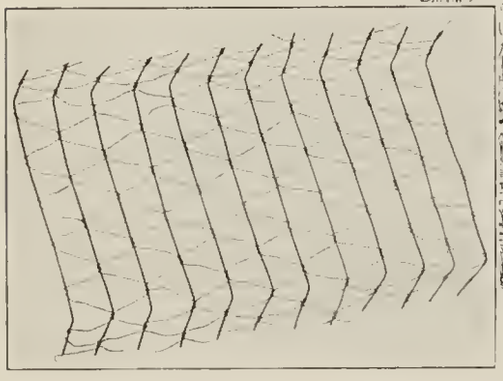


Continuous stirrups made from electrically welded fabric.

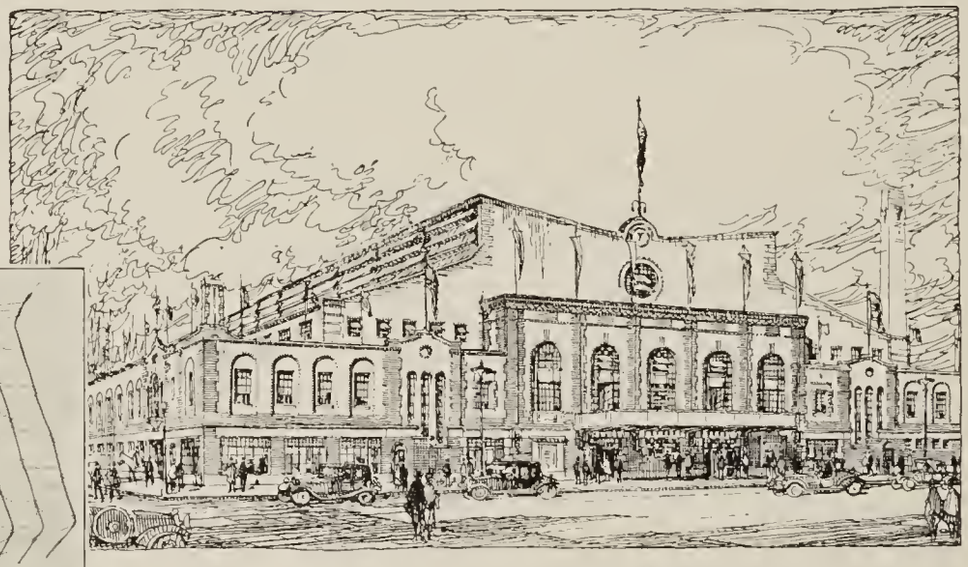
Continuous Stirrups

This machinery is especially fast and accurate in the making of continuous stirrups from electric welded fabric. Rolls of any standard spacing and size of wires and in widths up to 72 inches are cut into any desired length of sheet, by a shear which makes a cut the full width of the roll instantaneously. The cuts are made after the wire mesh has been drawn through electrically driven rolls and made perfectly straight and flat.

The mesh is then passed to the forming machine, which presses it into a box shapewith the edges turned down to rest on the forms and support the bottoms of the stirrups which carry the beam or joist reinforcement rods at any desired distance above the bottom of the beam or joist, thus doing away with any beam bar supports or spacers, except possibly at the center of the beam or joist where there are no stirrups.



All corners of the continuous stirrups are bent straight and in perfect alignment and the width and depth positively maintained. The mesh is sheared so accurately that the tips of the hooks bear uniformly on the slab forms. The simplicity of erection of this form of stirrup, and the supporting of main reinforcement bars without the need of special spacers or chairs, makes its superiority readily apparent over individual stirrups, or any other type of continuous stirrup, especially when it is considered that they are made from a standard mesh which is always in stock. No delays in filling any order, no breaking of wire at intersections as is often the case when continuous stirrups are made from ordinary wire and carelessly welded. Our continuous stirrups are listed and detailed with reinforcing bars and deliveries made how and when they are needed. Special precautions are taken when shipping by truck or freight to prevent bending or distortion of the stirrup.



The Riding Club of Chicago. Step reinforcement as illustrated at the left was furnished shaped to conform exactly to the contour of the finished steps.

In special cases where the size of an order warrants, special wire mesh can be furnished having the wires spaced at varying intervals to correspond with the theoretical spacing of individual stirrups.

Over 30,000 continuous stirrups of standard electric welded fabric were furnished by us for the New Palmer House at Chicago and a similar order was filled for the Stevens Hotel.

Step Reinforcement

Among the multitude of uses to which wire mesh has been put, is the reinforcement of steps and for this purpose Triangle Mesh is satisfactorily adapted. Thousands of bent sections as illustrated were furnished by us for the Riding Club of Chicago, the University of Chicago Stadium and other structures. These sections

were delivered at the job, shaped to conform exactly to the contour of the finished steps.

Beam Wrapping

The advantage of power-formed mesh over that usually bent by hand on the job is evident. Beam wrapping can be supplied formed and pressed to suit different widths of beam flanges and corrugated so as to maintain any required space between the bottom of the beam and the wrapping, thus providing a better material for the purpose than any of the well known beam clips. Its application at the job is a very rapid operation and will reduce the contractor's field costs.

Beam wrapping, to properly hold concrete to steel and to provide effective fire-proofing, should be of mesh with wires uniformly spaced so as to permit concrete to flow around them and yet serve as a proper binder. When properly shaped and attached, it is the most satisfactory material known for the purpose.

Triangle Mesh Reinforcement

Style No.	Number and Gauge of Wires Each Longitudinal	Sect. Areas Longit. Sq. In. per Ft. Width	Effective Sect. Areas sq. in. per Ft. of Fabric		Approx. Wt. lbs. per 100 Sq. Feet	Style No.	Number and Gauge of Wires Each Longitudinal	Sect. Areas Longit. Sq. In. per Ft. Width	Effective Sect. Areas sq. in. per Ft. of Fabric		Approx. Wt. lbs. per 100 Sq. Feet
			Trans.	Longit.					Trans.	Longit.	
LONGITUDINALS SPACED 4 INCHES, CROSS WIRES NO. 14 GAUGE SPACED 4 INCHES											
032	1—No. 12 ga.	.026	.022	.032	22	168	1—No. 2 ga.	.162	.022	.168	74
040	1—No. 11 ga.	.034	.022	.040	25						
049	1—No. 10 ga.	.043	.022	.049	28	180	2—No. 6 ga.	.174	.022	.180	78
058	1—No. 9 ga.	.052	.022	.058	32	208	2—No. 5 ga.	.202	.022	.208	89
						245	2—No. 4 ga.	.239	.022	.245	103
068	1—No. 8 ga.	.062	.022	.068	35	267	3—No. 6 ga.	.261	.022	.267	111
080	1—No. 7 ga.	.074	.022	.080	40						
093	1—No. 6 ga.	.087	.022	.093	45	287	3—No. 5½ ga.	.281	.022	.287	119
107	1—No. 5 ga.	.101	.022	.107	50	309	3—No. 5 ga.	.303	.022	.309	128
						336	3—No. 4½ ga.	.330	.022	.336	138
126	1—No. 4 ga.	.120	.022	.126	57	365	3—No. 4 ga.	.359	.022	.365	149
146	1—No. 3 ga.	.140	.022	.146	65						
153	1—¼ inch	.147	.022	.153	68	395	3—No. 3½ ga.	.389	.022	.395	160
LONGITUDINALS SPACED 4 INCHES, CROSS WIRES NO. 14 GAUGE SPACED 8 INCHES											
036-P	1—No. 12 ga.	.026	.009	.036	17	072-P	1—No. 8 ga.	.062	.009	.072	31
044-P	1—No. 11 ga.	.034	.009	.044	20	084-P	1—No. 7 ga.	.074	.009	.084	35
053-P	1—No. 10 ga.	.043	.009	.053	24	097-P	1—No. 6 ga.	.087	.009	.097	40
062-P	1—No. 9 ga.	.052	.009	.062	27						
LONGITUDINALS SPACED 4 INCHES, CROSS WIRES NO. 12½ GAUGE SPACED 8 INCHES											
041-R	1—No. 12 ga.	.026	.014	.041	21	077-R	1—No. 8 ga.	.062	.014	.077	35
049-R	1—No. 11 ga.	.034	.014	.049	24	089-R	1—No. 7 ga.	.074	.014	.089	40
058-R	1—No. 10 ga.	.043	.014	.058	28	102-R	1—No. 6 ga.	.087	.014	.102	44
067-R	1—No. 9 ga.	.052	.014	.067	31						

Electric Welded Fabric

Longitudinal Spacing	Transverse Spacing	Gauge of Longitudinal Wire	Gauge of Transverse Wire	Weight per 100 Square Feet	Longitudinal Spacing	Transverse Spacing	Gauge of Longitudinal Wire	Gauge of Transverse Wire	Weight per 100 Square Feet
2″	2″	14	14	21.1	4″	12″	9	12	21.8
2″	2″	12	12	36.8	4″	12″	8	12	25.5
3″	3″	14	14	14.2	4″	12″	7	11	30.7
3″	3″	12	12	24.7	4″	12″	6	10	36.5
3″	3″	10	10	40.5	4″	12″	5	10	41.6
4″	4″	14	14	10.8	4″	12″	4	9	49.4
4″	4″	13	13	14.1	4″	16″	7	11	29.7
4″	4″	12	12	18.7	4″	16″	6	10	35.2
4″	4″	10	10	30.6	4″	16″	5	10	40.4
4″	4″	8	8	44.1	4″	16″	4	9	47.9
4″	4″	6	6	61.9	4″	16″	3	8	56.1
4″	4″	4	4	85.3	4″	16″	2	8	64.3
6″	6″	12	12	12.7	6″	6″	8	8	2.7
6″	6″	10	10	20.7	6″	6″	7	7	3.2
6″	6″	9	9	25.1	6″	6″	6	6	3.8
6″	6″	6	6	42.0	6″	6″	5	5	4.4
2″	16″	7	11	54.8	6″	6″	4	4	5.2
2″	16″	6	10	64.7	6″	6″	3	3	6.1
2″	16″	5	10	74.6	6″	6″	2	2	7.0
2″	16″	4	9	88.5	6″	6″	1	1	8.2
2″	16″	3	8	103.6	6″	12″	7	7	2.4
3″	16″	7	11	38.1	6″	12″	6	6	2.9
3″	16″	6	10	45.1	6″	12″	5	5	3.3
3″	16″	5	10	51.8	6″	12″	4	4	3.9
3″	16″	4	9	61.4	6″	12″	3	3	4.6
3″	16″	3	8	72.0	6″	12″	2	2	5.3
3″	16″	2	8	82.6	6″	12″	1	1	6.2
3″	16″	1	7	96.2	4″	12″	8	8	2.7
3″	16″	0	6	112.9	4″	12″	7	7	3.2
4″	8″	13	13	10.6	4″	12″	6	6	3.7
4″	8″	12	14	12.2	4″	12″	5	5	4.4
4″	8″	12	12	14.1	4″	12″	4	4	5.2
4″	8″	11	12	17.0	4″	12″	3	3	6.0
4″	8″	10	12	20.3	6″	12″	0	6	5.9
4″	8″	9	12	23.4	4″	12″	6	7	3.6
4″	8″	8	12	27.0	4″	12″	5	7	4.1
4″	8″	7	11	32.7	4″	12″	4	8	4.5
4″	12″	12	12	12.6	6″	8″	5	8	3.2
4″	12″	11	12	15.5	6″	8″	2	4½	5.4
4″	12″	10	12	18.6					

Plain fabric (not galvanized) will be shipped on all unspecified orders.

Wire used in all fabric will develop 70,000 lbs. and over, per square inch tensile strength.

Widths of rolls or sheets are as follows: For 4-inch spacing of longitudinal wires, maximum width is 56 inches, with 60 inches possible in some styles, and is measured from center to center of outside longitudinal wires. For 6-inch spacing of longitudinal wires, maximum width is 60 inches, with 138 inches possible in some styles and is measured from center to center of outside longitudinal wires. For widths under 40 inches special prices will be used.

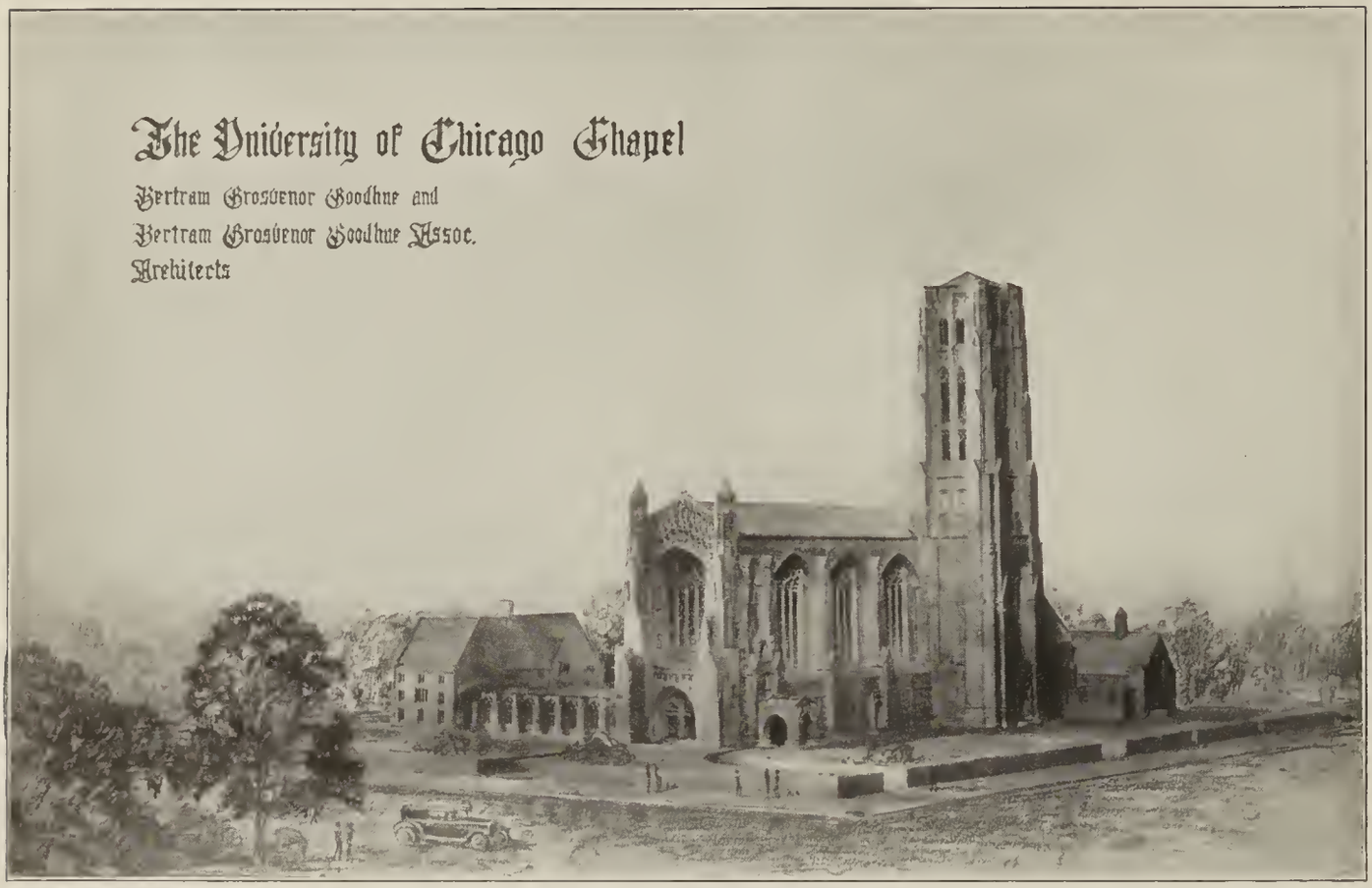
Stock lengths of rolls is 100 feet to 300 feet, depending on styles. Customers may specify length of rolls on orders not shipped from stock.

No extra charge for sheets 8 feet or over. Length of sheets to be specified by customer.

Styles having No. 3 gauge or heavier longitudinal members are recommended in sheets only.

Styles having No. 6 gauge or heavier longitudinal and transverse members, with 6-inch spacing or 12-inch spacing only, can be furnished in sheets up to 138 inches in width.

1. Hudson County Boulevard Bridge, Jersey City, N. J. *2. Manhattan Electrical Supply Co.* *3. The Stevens Hotel, Chicago, Ill.*
4. National Grocery Co., Jersey City, N. J. *5. St. Xavier Novitiate for Society of Jesus, Milford, O.* *6. Calumet High School, Chicago, Ill.*



The University of Chicago Chapel.

Steel Forms For Concrete Joist Construction

WE are in a position to supply Steel Forms of the leading makes, for permanent installation or on a rental basis. A sufficient number are furnished and erected to permit progress of the work as required by the contractor. When they are taken down and returned to the warehouse, the contractor is charged a nominal rental for their use and hauling, erection and removal.

Forms for concrete joist construction are substantial and unyielding, properly braced and supported so that the concrete may conform to the design, and sufficiently tight to prevent the leakage of cement and grout.

They should be left in place until the concrete has attained sufficient strength to support itself and any super-imposed loads with safety. The work should be carefully inspected before the forms are removed.

When steel forms are furnished on a rental basis they are erected on open wood centering which is put up substantially, by the contractor, and at his expense. If the erection and the removal of the steel forms is to be performed by us, the contractor must furnish us with the free use of hoists and scaffolding, and the services of an engineer, if required, are to be paid for by the contractor.

When pouring concrete during cold weather, heat from salamanders is transmitted through the steel forms directly to the concrete, and the steel forms may be removed soon after the con-

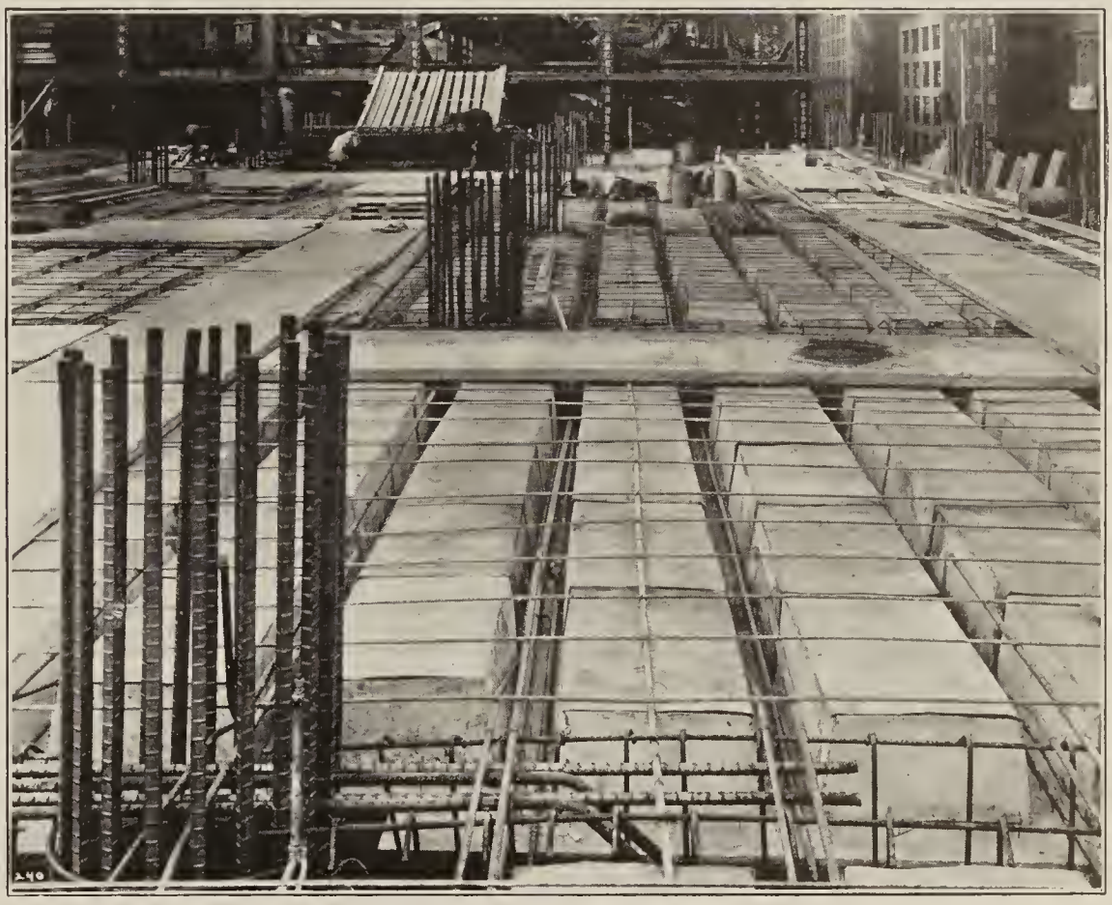
crete has set, by placing a temporary line of shores through the center of each panel.

Steel forms are made in standard units so that the most economical size of concrete joists for all conditions of loading may always be obtained. Full benefit of the tee section of every joist is secured, thus eliminating all non-carrying concrete, and effecting enormous savings in dead load throughout beams, columns and footings.

This reduction in dead load makes a decidedly apparent saving in the concrete and steel required.

Standard steel forms give depths of joists of six, eight, ten, twelve and fourteen inches. Special forms can be furnished for joists having a depth of eighteen inches.

We can also furnish tapered end forms which effect an increase in the width of the joist as it approaches the support, thus providing the necessary concrete where the shear is greatest and where it is needed for negative compression at the support.



Removable Steel Forms in Place.

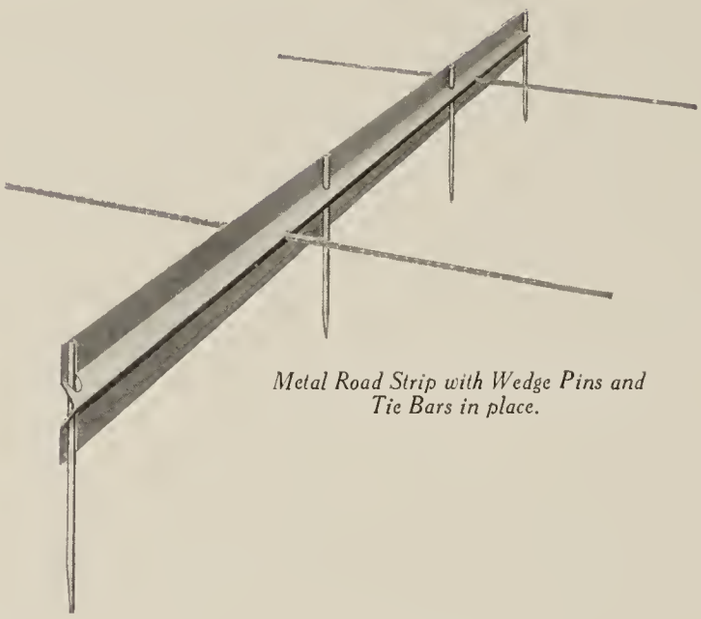
Double tapered end forms, in addition to increasing the width of the joist, also increase the depth of the compression flange or tee of the supporting beam or girder, without increasing the area of concrete below the neutral axis where it is useless.

The supporting flanges of all tapered end forms are of the same width as the flanges of intermediate steel form sections, so that it is not necessary to provide extra centering to take care of the increase in the width of the joists.

Steel forms can be furnished in widths of 6, 8, 10, 12, 15, 20, 25 inches and for steel forms 18 inches in depth the width is 30 inches. All of the above widths are special except the 20 inch.

Steel forms, for permanent installation in cases where metal lath or rib lath is to be attached so as to afford a flat ceiling, can also be furnished. Flat ceilings can, however, be obtained with metal lath or rib lath when removable forms are used. The tie wires or other fastenings for the lath are embedded in the concrete, but exposed so that the ceiling lath can be readily fastened in place after the wood centering has been removed.

Bar Supports for Road Work.



Metal Road Strip with Wedge Pins and Tie Bars in place.

Longitudinal Bar Locked in Position.

Metal Road Strips

A METHOD of reinforcing concrete roadways which is meeting with favor in many states, is that adopted by the Illinois State Highway Commission. This provides for building into the center of the roadway a longitudinal joint in which is set vertically a sheet metal road strip having a 1½"-V groove at the center. This strip is of No. 18 Gauge steel 5½" wide and furnished in lengths of ten feet two inches. The strip is painted black. It is held in position with pointed sheet steel pins eighteen inches long driven through holes provided in the V-Groove and down into the soil or sub-pavement.

The V-Groove serves as a modified dove-tail joint uniting the two halves of the pavement. These halves are still further tied together by ½-inch round deformed bars, 4 feet long, inserted through holes in the center of the metal strip, and spaced 5 feet on centers.

The ends of the ½ inch bars are held at the center of the pavement by means of sheet metal supports inserted in the soil so as to maintain the ends at a height of 3 inches above the ground, or at the center of the concrete pavement.

At the edges of the pavement a smooth ¾-inch rod is placed at either side to prevent cracks which might be produced by the curling of the edges of the pavement under temperature changes.

These bars are furnished in 27-foot lengths and are lapped 2 feet at their ends. They are supported 4½-inches above the soil by metal supports as illustrated above.

MATERIAL REQUIRED FOR ONE MILE OF ROADWAY

(Illinois State Highway Specifications)

5368 lineal feet 5½" No. 18 gauge metal strip	Weight	6,039 lbs.
1584 wedge pins	Weight	475 lbs.
2112 supports for ¾" bars	Weight	633 lbs.
1056 supports for ½" bars	Weight	111 lbs.
423 pieces ¾" plain rounds, 27'-0"	Weight	17,125 lbs.
1056 pieces ½" round deformed bars 4'-0"	Weight	2,817 lbs.

Where heavier pavement is required substitute the following:

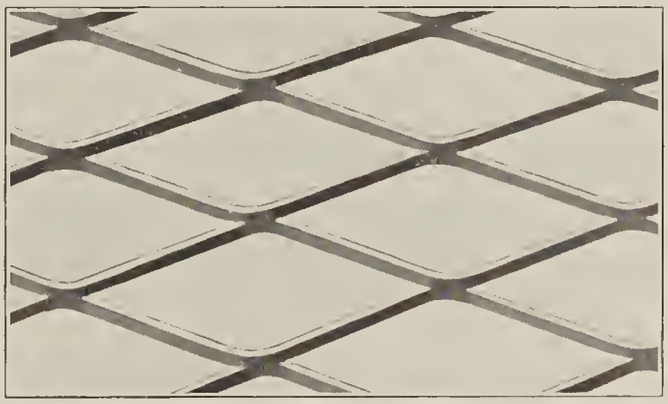
528 pieces 6½" No. 18 gauge metal strip	Weight	6,978 lbs.

Expanded Metal Reinforcing

SOME engineers prefer expanded metal for reinforcing purposes, because the shape and slightly roughened surface of the strands of the diamond-shaped mesh make an ideal grip for the concrete. The openings of the mesh are sufficiently large to permit the concrete to completely surround and embed the steel, forming a perfect bond and adhesion.

The solid network of meshes immediately take up a concentrated load and distribute it equally over a wide area, all of the adjoining strands in proximity to the concentrated load being immediately put in tension. Any tensile stress tends to compress the diamonds constituting the fabric, and this in turn is resisted by the concrete within the mesh.

The effect of stresses which would often be disastrous to straight line reinforcement is minimized when expanded metal is used. This reinforcement constitutes a protection against shocks and concentrated loading probably greater than that to be had with other types of reinforcing.



Expanded from solid metal.

Expanded metal comes in meshes varying from 1/2 inch by 1 1/4 inch to 3 inches by 8 inches and in a wide range of stock sizes. The smaller meshes are generally used for constructing machine guards, open partitions, lockers and for special manufacturing purposes. The 3-inch sizes are for reinforcing concrete.

Each style has a definite steel area and this area is used as part of the number designating the style. Thus No. 15-3 has 15/100 sq. in. of steel area for every 12 inches in width of the material, measured across the short diameter of the diamond. Even devisors of stock sizes can be furnished at a slight additional charge to cover cost of shearing. In such cases, the number of sheets ordered must consume the entire stock sheet. For example, if style 40-3 stock (width 7 feet) is ordered 3'-6" wide, there must be an even number of sheets—2, 4, 6—not 1, 3, 5, etc. (Note: One dimension—either width or length—must not be over 8 ft., on account of the limitations of car space.)

Widths given in the following table apply to the dimension of the sheet, measured across the short diagonal of the mesh; lengths apply to the dimension of the sheet as measured along the long diagonal of mesh. When not otherwise stated, the first of two dimensions is always taken as the width.

Gauges are mentioned merely in the way of general information. We reserve the right to cut any style from the thickness of metal most convenient, provided only that we supply the indicated weight per square foot.

REINFORCING MESHES

Style	Mesh and Gauge	Lbs. per Sq. Foot	Standard Size of Sheets		Style	Mesh and Gauge	Lbs. per Sq. Foot	Standard Size of Sheets	
			Width	Length				Width	Length
06-3	3" — 16 ga.	.20	6' 0"	8 ft. and 12 ft.	35-3	3" — 10 ga.	1.19	6' 0"	8 ft., 10 ft., 12 ft.
08-3	3" — 16 ga.	.27	6' 0"	8 ft. and 12 ft.	40-3	3" — 7 ga.	1.36	7' 0"	8 ft., 10 ft., 12 ft.
10-3	3" — 13 ga.	.34	4' 0"	8 ft. and 12 ft.	45-3	3" — 7 ga.	1.53	6' 3"	8 ft., 10 ft., 12 ft.
125-3	3" — 13 ga.	.42	5' 6"	8 ft. and 12 ft.	50-3	3" — 7 ga.	1.70	5' 9"	8 ft., 10 ft., 12 ft.
15-3	3" — 10 ga.	.51	7' 0"	8 ft., 10 ft., 12 ft.	54-3	3" — 7 ga.	1.83	5' 6"	8 ft., 10 ft., 12 ft.
176-3	3" — 10 ga.	.60	6' 0"	8 ft., 10 ft., 12 ft.	60-3	3" — 7 ga.	2.04	4' 9"	8 ft., 10 ft., 12 ft.
20-3	3" — 10 ga.	.68	5' 6"	8 ft., 10 ft., 12 ft.	65-3	3" — 7 ga.	2.19	4' 3"	8 ft., 10 ft., 12 ft.
25-3	3" — 10 ga.	.85	4' 3"	8 ft., 10 ft., 12 ft.	10-2 1/4	2 1/4"— 16 ga.	.34	5' 0"	8 ft. and 12 ft.
30-3	3" — 10 ga.	1.02	7' 0"	8 ft., 10 ft., 12 ft.	15-2 1/4	2 1/4"— 13 ga.	.51	4' 9"	8 ft. and 12 ft.

SPECIAL MESHES

06-1 1/2	1 1/2"— 18 ga.	.20	2' 9"	8 ft. only	24-3/4	3/4" — 13 ga.	.80	4'&6"	8 ft. and 12 ft.
18-1 1/2	1 1/2"— 13 ga.	.60	4' 0"	8 ft. and 12 ft.	53-3/4	3/4" — 9 ga.	1.80	4' 6"	8 ft. only
375-1 1/2	1 1/2"— 9 ga.	1.28	6' 0"	8 ft. only	20-1/2	1/2" — 18 ga.	.68	4'	8 ft. only
15-3/4	3/4" — 16 ga.	.51	7' 0"	8 ft. and 12 ft.					

Service for the Plastering Contractor

WE ARE now in a position to furnish all the steel requirements for plastering with service similar to that given contractors on all kinds of reinforcing material. Orders and inquiries will be handled by the same department.

This new service includes expanded metal, metal lath, rib lath, scotch lath, corner bead, bull nose bead, picture mold, curved point base screed, base grounds, hot rolled channels, cold formed channels, pencil rods, angles, tees, flats, wire, etc.

Immediate deliveries can be made from our warehouse stocks, or if desired, shipments can be made direct from factories located at Chicago and in the East.

Shipments from our warehouses are systematically scheduled so that deliveries can be made how and when required at the job. Our fleets of motor trucks delivering the many commodities we handle, put us in a position to render an unsurpassed service. For like reasons we are able to make shipments by railroad so that but few delays occur in transit, and combination shipments with other materials we handle, can often be effected with a consequent saving in freight charges.

Ryerson Stucco Base

Ryerson stucco base is equally satisfactory for either "gunited" or hand placed stucco. It is cut and expanded from sheet steel, with a special mesh 1½ inches wide by 3 inches long. This provides ample space for the mortar

Stucco Base

to pass freely through the openings, thoroughly reinforcing and keying the stucco.

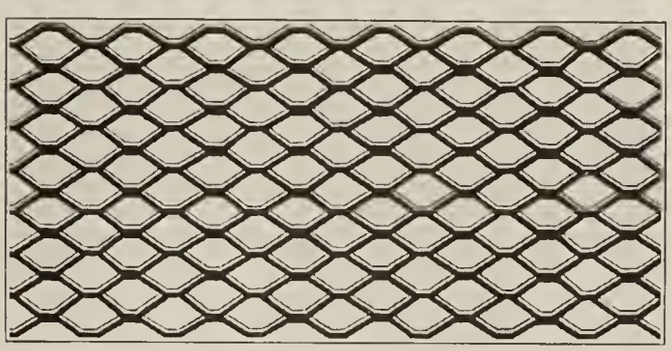
Ryerson stucco base is furnished painted and packed in flat sheets, 9 to the bundle.

SIZES AND WEIGHTS

Weight per Square Yard	Size of Sheets	Square Yards per Bundle	Weight per Bundle
1.8 lbs.	48″ x 96″	32	58 lbs.
3.6 lbs.	51″ x 96″	34	123 lbs.

Ryerson Expanded Metal Lath

Ryerson expanded metal lath is cut from sheet steel and expanded to a diamond mesh flat sheet. Each mesh is three-eighths of an inch wide at its narrowest dimension. This material will be found the equal if not superior to any other type of lath in general use. When the plaster is applied so as to completely embed the



Expanded Metal Lath.

metal it serves as a reinforcing for the plaster as well as a key.

Ryerson expanded metal lath presents a flat, rigid plastering surface that facilitates the application of plaster and requires only a minimum of material; yet it is flexible, and can be readily bent or formed to take care of the requirements of ornamental plaster work.

Metal lath is furnished painted and is sold in flat sheets, with straight parallel edges on the long sides so that the lath laps easily with minimum waste.

SIZES AND WEIGHTS

Wt. per Sq. Yd.	Width of Sheets	Length of Sheets	Sheets per Bundle	Yds. per Bundle	Weight per Bundle
3.4 lbs.	24″	96″	9	16	54.4 lbs.
Can be furnished cut from galvanized sheets or pure iron, direct from factory.					
3.0 lbs.	24″	96″	9	16	48.0 lbs.
Can be furnished cut from pure iron when especially ordered.					
2.5 lbs.	24″	96″	9	16	40.0 lbs.
Can be furnished cut from galvanized sheets or pure iron, direct from factory.					
2.2 lbs.	24″	96″	9	16	35.2 lbs.

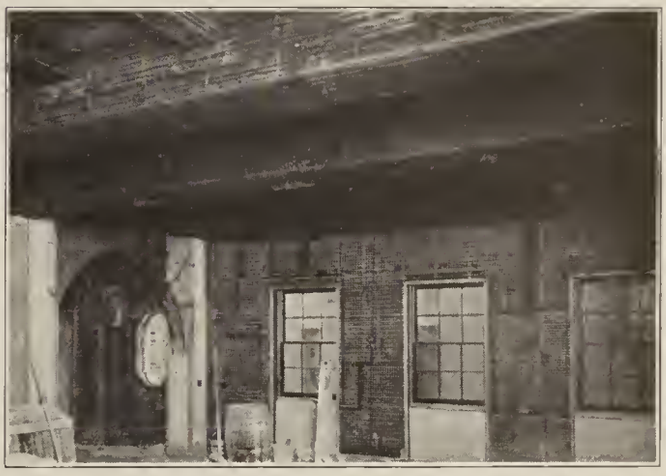
Metal lath and plaster are an excellent protection for wood studs and joists. The Underwriters Laboratories give this material a one-hour rating as compared with the 20 minutes protection of wallboard and the 12 minutes duration of wood lath.

Metal lath is particularly well adapted for use on stud bearing partitions and stud exterior walls including fire stops; for ceilings under inhabited floors, especially over heating plants, fuel storage, etc., at chimney breasts, around flues and back of kitchen ranges; for stairwalls and under stairs and as a base and reinforcement for exterior stucco. It should be used for crack prevention on ceilings of important rooms; as a lap on either side of wall and partition angles, and around door bucks; back of wainscots and tile mantels and across plumbing pipes and heat ducts.

Ryerson Copper Bearing Metal Lath

Ryerson copper bearing metal lath is identical in size and shape of mesh and in size of sheets with Ryerson standard metal lath. It is cut from a special copper-bearing sheet, and is intended for use in warm, damp climates, in salt-laden air, by the sea coast, in manufacturing sections—or wherever unusually trying atmospheric conditions exist, and also where deteriorating elements exist in the plaster used.

Ryerson copper bearing metal lath is painted with a special red paint and can be furnished immediately from the factory in sheets weighing 3.4 and 2.5 lbs. per square yard. On special order it can be furnished in sheets weighing 3.0 and 2.2 lbs. per square yard.



Metal Lath and Furring installation.

Ryerson Corrugated Expanded Metal Lath

Ryerson corrugated expanded metal lath is standard metal lath corrugated so as to produce ribs 1/4-inch deep running lengthwise of the sheet and spaced 1 1/2-inches apart. The ribs being the same open mesh as the remainder of the lath surface, permits the plaster to key and completely embed the rib.

Corrugated lath is a self-furring lath which eliminates the cost and labor of wiring on separate furring and which is stiff enough to permit unusually wide spacing of supports.

SIZES AND WEIGHTS

Wt. per Sq. Yd.	Width of Sheets	Length of Sheets	Sheets per Bundle	Yards per Bundle	Weights per Bundle
3.4 lbs.	24″	96″	9	16	54.5 lbs.
Also furnished cut from galvanized, pure iron or copper-bearing sheets.					
3.0 lbs.	24″	96″	9	16	48.0 lbs.
Also furnished cut from pure iron or copper bearing sheets on special order.					
2.5 lbs.	24″	96″	9	16	40.0 lbs.
Also furnished cut from galvanized, pure iron or copper-bearing sheets.					
2.2 lbs.	24″	96″	9	16	35.2 lbs.
Also furnished cut from copper-bearing sheets, on special order.					

Ryerson Burial Vault Reinforcing

This is an extra heavy type of metal lath frequently specified for lath in post offices, schools, public buildings, and also for other types of construction which require an unusually heavy plastering base. The size of the mesh of this material is approximately twice as large as the mesh of Ryerson expanded metal lath and the strands $\frac{3}{32}$ of an inch wide (almost $1\frac{1}{2}$ times as wide), thus giving it unusual strength.

Burial vault lath as its name implies, is used by the manufacturers of cement burial vaults and caskets, supplying the strength required for the vault or casket to successfully withstand earth pressures and handling. Burial vault reinforcing is also frequently used in other types of concrete specialties where a meshed reinforcing of this type is required.

Burial vault is cut from steel sheets and furnished painted. It can also be cut from pure iron, copper-bearing or galvanized sheets, on special orders.

SIZES AND WEIGHTS

Wt. per Sq. Yd.	Width of Sheets	Length of Sheets	Sheets per Bundle	Yards per Bundle	Weight per Bundle
3.4 lbs.	24″	96″	9	16	54.4 lbs.
2.5 lbs.	24″	96″	9	16	40.0 lbs.

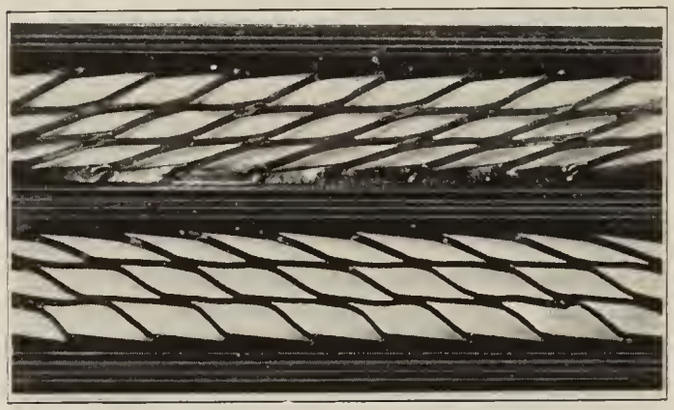
Note: Long dimension of the mesh runs lengthwise of the sheets.

Ryerson Scotch Metal Lath

This is a distinctive type of rib lath in great demand because of its mortar-saving qualities and the ease and rapidity with which it can be erected and covered.

Its sections of small diamond mesh are connected by flat ribs about $\frac{1}{2}$ inch wide and spaced 1.5 inches from center to center. Along the center of each rib is a bead $\frac{1}{8}$ inch high. Ribs and mesh are formed from a single sheet of steel.

It affords an excellent plastering surface, its stiffness endwise preventing any give or sag under the trowel. At the same time it is sufficiently flexible sideways to use on cove work, for wrapping of beams, columns, etc. The selvage edge nests or interlocks with the next sheet so that there is no loss of coverage on side laps.



Scotch Metal Lath.

The mortar-saving qualities of this lath are especially important. Only about 60% of the area of a sheet permits the passage of mortar, just sufficient passing through to afford an adequate key. The $\frac{1}{8}$-inch ribs are adapted for use with $\frac{1}{2}$-inch grounds, thus requiring less mortar on the scratch coat than on any other type of metal lath. On ceilings where there are no grounds, the thickness of scratch and brown coats can be made the same as for $\frac{1}{2}$-inch grounds. The rapidity with which such thin coats dry out permits the quicker application of the succeeding coats, thereby speeding up the work.

SIZES AND WEIGHTS

Weight per Sq. Yd.	Size of Sheets	No. of Sheets per Bundle	No. of Yards per Bundle	Weight per Bundle
3.4 lbs.	24″ x 96″	9	16	54.4 lbs.

Furnished cut from standard steel sheets and painted black, also from copper-bearing sheets, painted red. Black sheets only are carried in stock.

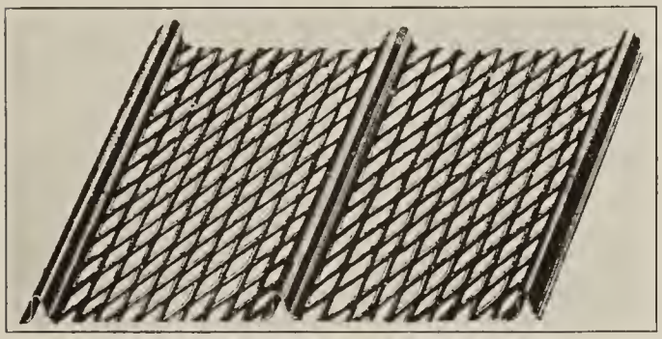
Scotch lath is as easy to plaster over as wood lath, and can be erected far more rapidly. It will be found a satisfactory and economical base for all types of interior plastering (including ceilings under concrete floors or steel core construction) and also for tile-setting jobs, bathrooms, mantles, etc.

Ryerson $\frac{3}{8}$ Inch Rib Metal Lath

This is a rib-lath of exceptional rigidity, which is economical of plaster and exceedingly easy to erect.

Owing to its stiffness, wider spacing of the studs is permissible and less nailing and tying are required. Moreover it provides a working surface free from sag or waves, making it possible for the plasterer to do his best work in minimum time and at the least cost.

This lath is made of 4-inch sections of diamond mesh connected by U-shaped ribs 3/8-inch high. Ribs and mesh are formed from a single sheet of steel. The ribs impart additional stiffness while the small size of the diamonds in the connecting mesh prevent undue waste



3/8-inch Rib Lath.

of plaster. It is particularly satisfactory for suspended ceilings, partition work, in connection with steel pans, cored floors, etc. Furnished painted. (On special order it can be supplied cut from copper-bearing sheets.) Packed 9 sheets (16 square yards) to a bundle.

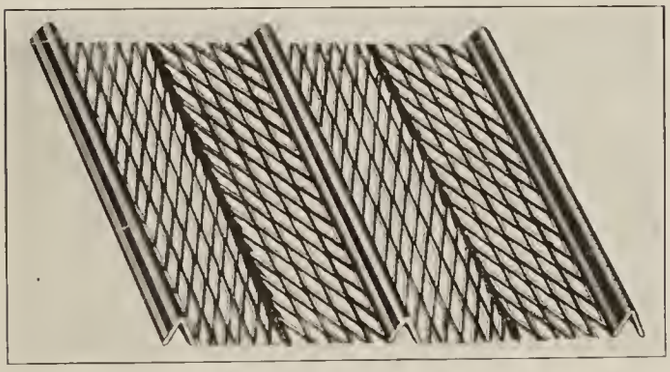
It can also be supplied cut from pure iron sheets on special order, but only in lath weighing 4.0 lbs. per square yard.

SIZES AND WEIGHTS

Weight per Sq. Yd.	Weight per Bundle	Spacing of Ribs	No. of Ribs per Sheet	Size of Sheets	Cross Sectional Area per Ft. of Width
3 0 lbs.	48 lbs.	4″ C to C	7	24″x96″	0.098 Sq.In.
3.5 lbs.	56 lbs.	4″ C to C	7	24″x96″	0.114 Sq.In.
4.0 lbs.	64 lbs.	4″ C to C	7	24″x96″	0.130 Sq.In.

Ryerson 3/4″ Rib Lath

Ryerson 3/4″ Rib Lath is expanded from a single sheet of steel. It is an excellent reinforcement for concrete



3/4-inch Rib Lath

floors, roof, walls, etc. Its deep ribs and strong mesh eliminate the need of wood forms. The small mesh openings prevent seepage of the concrete. The parallel U-shaped ribs are spaced 4.8″ center to center. Each mesh section consisting of two rows of diamonds is connected by a shallow V-shaped rib which adds materially to the rigidity of the lath.

The outer U-shaped ribs fit together snuggly in erection and produce a joint with strength equal to that of the sheet.

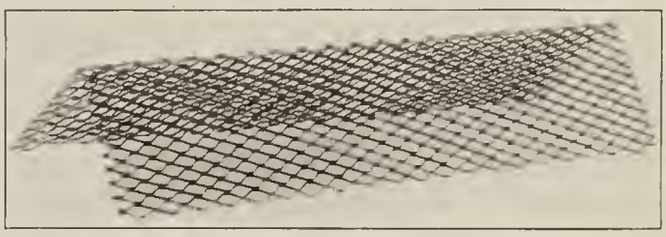
3/4 inch rib lath is furnished painted and packed 8 sheets to the bundle.

SIZES AND WEIGHTS

Weight per Sq. Yd.	Width of Sheets	Length of Sheets	No. of Ribs per Sheet	No. of Sheets per Bundle
4.5	28.8″	8′, 9′, 10′, 11′, 12′	7	8
5.4	28.8″	8′, 9′, 10′, 11′, 12′	7	8
6.75	28.8″	8′, 9′, 10′, 11′, 12′	7	8

Ryerson Corner Strip

Ryerson Corner Strip is used to prevent corner cracks in wood lathed buildings. These straight strips of metal lath are bent sharply at a true angle so they fit properly

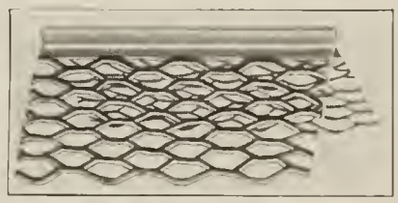


Corner Strip

and are easily and quickly erected. The "L's" are 4″x4″. Packed in 6-foot lengths, 25 pieces to the bundle and four bundles (800 lin. ft.) to the crate. Furnished painted.

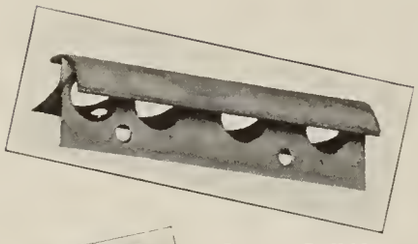
Ryerson Expanded Corner Bead

This expanded flange corner bead is made from 26-gauge galvanized sheet steel. The groove back of the round nose holds the plaster flush and provides a perfect bond. The heavy shoulder assures straightness.

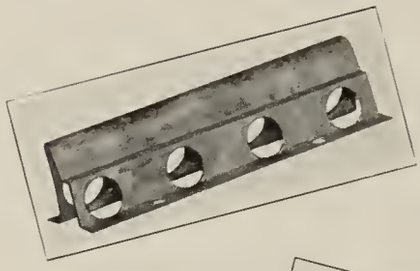


Expanded Corner Bead

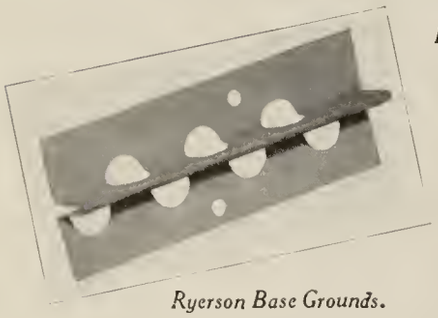
It can be furnished in stock lengths of 6, 7, 8, 9, 10 and 12 ft., packed 10 pieces to the bundle.



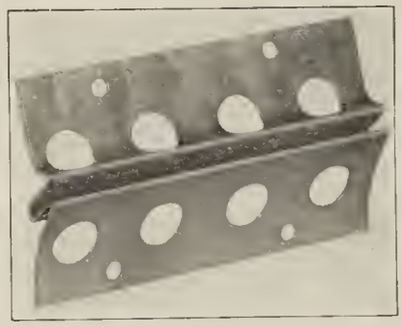
Ryerson Bull Nose Corner Bead.



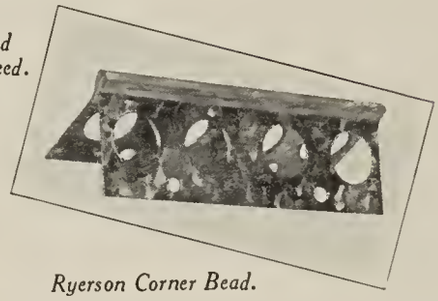
Ryerson Curved Point Base Screed.



Ryerson Base Grounds.



Ryerson Picture Mold.



Ryerson Corner Bead.

Ryerson Galvanized Corner Bead

Galvanized corner bead of the customary wing type is always carried in stock. It is an absolutely reliable guide for the plasterer to work to. It takes care of all ordinary thickness of plaster and can be used with a special clip when the unevenness of the wall requires an extra thick plaster coat.

Large perforations in the wings assure a splendid clinch, or bond, just where it is most needed—the plaster so covering and keying into the bead that it virtually becomes an integral part of the wall itself. The small perforations are convenient for nailing or wiring to the underlying structure.

All corner bead is shipped in wood crates to prevent damage in handling and in transit to destination. It is packed 100 pieces, or ten bundles to a crate, a thousand lineal feet, and weighing approximately 200 lbs., including the crate.

Corner bead is made from 26 gauge galvanized sheets and is carried in stock in lengths of 8 feet-6 inches, 9 feet-0 inches and 10 feet-0 inches. Lengths of 6 feet-0 inches, 7 feet-0 inches, 8 feet-0 inches and 12 feet-0 inches can be furnished promptly from the factory. Clips for this bead will be furnished only when especially ordered.

Ryerson Bull Nose Corner Bead

Bull nose corner bead is similar to the standard type of corner bead except for the rounded surface which forms a "bull nose" finish for the plaster. It has a nose radius of ¾ inch and is made from 26 gauge galvanized steel. It can be furnished in lengths of 6, 7, 8, 9 and 10 feet. This bead requires clips for attaching.

Ryerson Base Grounds, or Screeds

Ryerson base grounds are used in place of wood screeds between cement base and plastered walls. They provide an excellent ground for the plaster and cement work. They are made from No. 24 or No. 26 gauge galvanized steel and serve as ½-inch grounds. Provided with clinch holes on both sides. Furnished in 10 foot lengths.

Ryerson Curved Point Base Screed

Ryerson curved point base screed is used where plaster meets a cement or composition base and forms a molded finish at the joint. It is used as a ½-inch ground. Made from No. 26 gauge galvanized steel and shipped in 10 foot lengths.

Ryerson Galvanized Picture Mold

Ryerson picture mold is a ground or screed, in combination with an inclined slot, forming a picture hook aperture in the plastered wall. It is especially adapted for use in strictly fireproof buildings where wood picture mold is undesirable, or where a projecting molding is not in keeping with the decorative treatment of a room.

It is made of No. 26 gauge galvanized steel and can be furnished in 10 foot lengths.

Public School at Sparta, Wisconsin.

Hot Rolled Channels

WE ARE always prepared to furnish standard hot rolled channels of bar sizes and lengths shown in the Ryerson Journal and Stock List. The sizes for plastering range from 3/4 inch by 5/16 inch by .065 inch up to 2 inches by 9/16 inch by .1875 inch and almost every intermediate and larger size and weight manufactured, can be supplied immediately from stock.

Unless otherwise specified they are always furnished unpainted, but on special order they will be dipped and painted and put up in bundles before shipment.

We wish to call special attention to new light furring channels which are carried in stock.

HOT ROLLED PLASTERING CHANNELS

Size in Inches	Weight per 1,000 Feet	Lengths Carried in Stock
3/4 x 5/16 x .065	300	18-20-25
1 x 3/8 x .079	430	18-20-25
1 1/4 x 3/8 x .104	650	18-20-25
1 1/2 x 1/2 x .125	1120	20-25
2 x 9/16 x .1875	1860	20-25

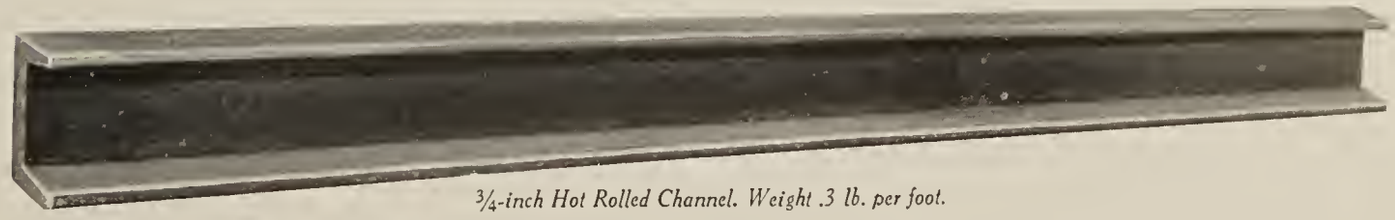
Cold Formed Channels

These are light-weight channels rolled or otherwise formed cold from standard 16 gauge steel sheets with the legs or flanges exactly perpendicular to the back. They are popular with many builders because of their strength combined with their very light weight and also the facility with which they can be cut or bent. They are square and straight, free from curl or twist and can be readily spliced by merely interlocking the flanges.

Like the hot rolled channels they are used for studding in solid or hollow partitions, for furring on flat or suspended ceilings, false beams, columns, cornice work, etc. They are particularly well adapted for the elaborate ornamental work and arched ceilings of theatres.

COLD FORMED CHANNELS

Size of Depth	Width of Flanges	Lengths in Feet	Weight per 1.000 Lin. Ft.	No. of Pieces per Bdl.	Gauge of Steel
3/4"	3/8"	12, 14, 16, 18, 20	276 lbs.	20	No. 16
1"	3/8"	12, 14, 16, 18, 20	332 lbs.	20	No. 16
1 1/2"	7/16"	12, 14, 16, 18, 20	456 lbs.	10	No. 16
2"	1/2"	16, 18, 20	580 lbs.	10	No. 16
Wide Flange Channels					
3/4"	3/4"	18, 20	276 lbs.	20	No. 19



3/4-inch Hot Rolled Channel. Weight .3 lb. per foot.

Pencil Rods, Hangers, Braces, Tie Wire, Etc.

Plastering Accessories and the many Steel Products such as Bolts, Coach and Lag Screws, Nails, etc., delivered at once.

PENCIL rods are used where attached ceilings come under concrete joists and floors with removable metal tiles, domes, or pans.

They are used in lieu of attachment of channels, are 1/4-inch in diameter and are placed at right angles to the joist. They are attached directly to wire hangers cast into the concrete joists.

Pencil rods are sometimes used with the above construction when 3/4-inch furring channels are attached to the hangers parallel to the joists. In such construction the pencil rods are attached transversely to the furring channels by not less than three loops of 18 gauge galvanized annealed wire. They are spaced not to exceed 11 3/4-inch centers for 3 lb. metal lath; 15 3/4-inch centers for 3.4 lb. metal lath; or 19 1/2-inch centers for scotch lath, or for 3/8-inch rib lath weighing not less than 3 lbs. per square yard. Where heavier rib lath is used pencil rods may be omitted.

Hangers, where the ceiling is to be applied directly against the bottom of concrete joists or masonry floors, are made of not less than No. 9 gauge galvanized annealed wire placed in the slab or beam before pouring concrete. A loop or other deformation is provided in each hanger to positively engage the concrete. Such hangers are spaced not to exceed two feet in a direction parallel to the joists and not further apart in the transverse direction than the center to center distance of the joists.

Where pencil rods are used for ceilings they are applied directly against the bottom of concrete joists, and in lieu of attachment to 3/4-inch channels. Hangers are used of not less than 14 gauge galvanized annealed wire and spaced not to exceed 11 3/4-inch centers for 3 lb. metal lath, 15 3/4-inch centers for 3.4 lb. metal lath or 19 1/2-inch centers for scotch lath or for 3/8-inch rib lath.

For suspended ceilings the minimum size for hangers is No. 8 gauge galvanized wire, 1-inch by 3/16-inch flat steel, or 7/32-inch round mild steel rods. They are spaced not to exceed 4 feet center to center in both directions, except that hangers are spaced not to exceed 2 feet on centers along runner channels when 3/4-inch runner channels are used.

Braces

Braces or Spacers are used in hollow partition construction for fastening together the runner channels on either side of the partitions.

They are usually of 1-inch by 3/16-inch strap steel, punched for attachment to the runner channels by means of stove bolts. They are usually spaced approximately 3 feet on centers.

Tie Wire, Etc.

Tie wire for attachment of all metal work used in plastering is always in stock and can be shipped and delivered with metal lath. Consult the Ryerson Journal and Stock List when ordering wire.

We are prepared to furnish strap iron for brackets or clips, bent and punched as required; U-bolts, hook bolts, expansion bolts, machine bolts, stove bolts, lag screws, coach screws, nails; in fact the plastering contractor can obtain from us anything he may need for the most complicated or elaborate job of plastering.

The N. Shure Co. Building.

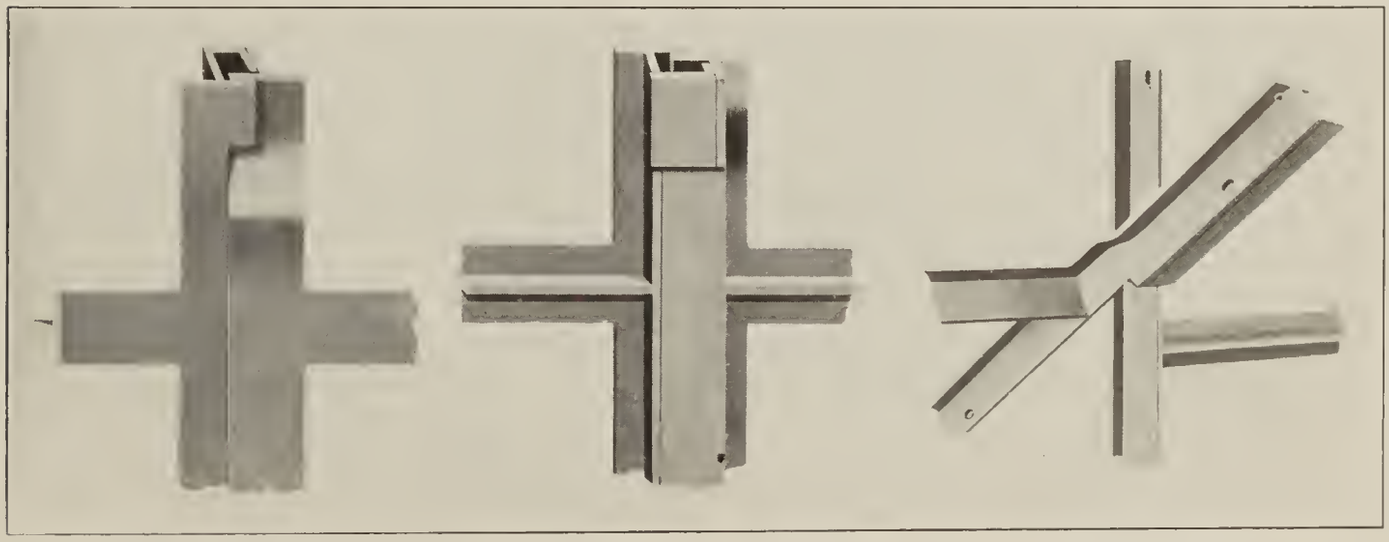
Welded Solid Steel Industrial Sash

STEEL sash now forms an important part of the contractors steel requirements. Febrisco welded solid steel industrial sash has several features which are points of superiority over other types of industrial sash.

All sash intersections are electric arc welded, the weld producing a joint as strong as the section, and one which is absolutely rigid. The sash is so assembled at the factory that it is absolutely true to dimensions, and after welding, will not rack out of square in handling or erection.

There are no points at which one member passes through another and there are no points at which moisture can enter to set up corrosion.

There is no cutting away of the section to form joints and the point of intersection is as strong as any part of the sash thus, it is possible

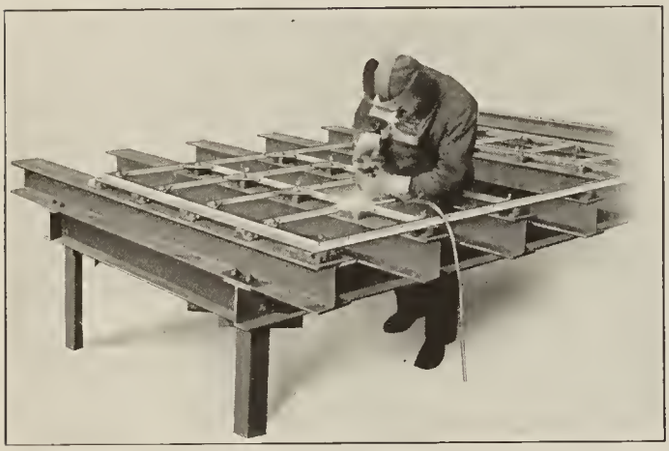


Exterior View of Pivot. Note double Contact Weathering.

Interior View of Pivot.

Pivot with Ventilator Partly Open.

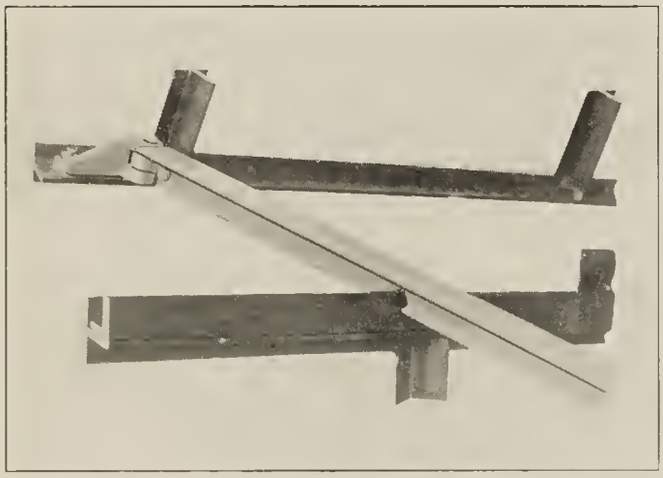
to use steel sections, of reduced weight, with a consequent saving in freight and handling charges.



Specially designed welding tables assure accuracy of dimensions.

Because all joints are welded, it is possible to construct a sash with a flush exterior surface free from projections, overlapped surfaces or ledges, avoiding the collection of dirt and moisture; making all surfaces accessible for painting, and presenting a more pleasing appearance than the molded types.

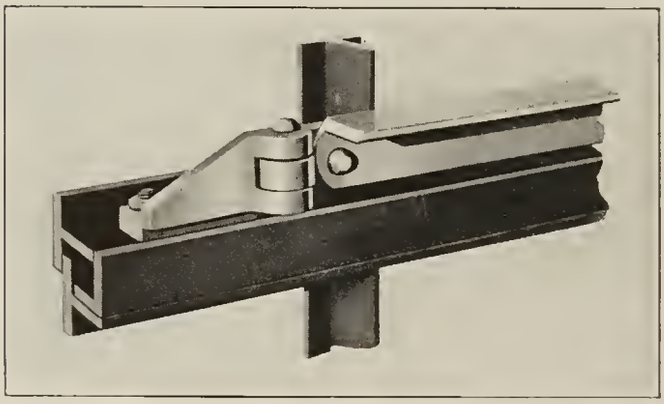
The pivot of center pivoted ventilators is located 1½ inches above the horizontal center



Push bar ventilator operator.

line of the sash. Formed out of the sash members, it contains no bolts, nuts, cotters or washers to work loose and get lost. It has no friction plates to rust and stick. It requires no adjustment. One man without the use of tools, can remove and replace a ventilator in a sash without difficulty, and in a very short space of time. Double contact weathering is provided continuously around all four sides of the ventilator, assuring a ventilator not only tight against rain, but one which is wind-proof as well, the latter being an important consideration in cold climates. Both headers and sills of the ventilators are provided with a wide overlap, which forms a perfect drip, while condensation moisture is carried outside the sash through the weep holes at the sill.

Center pivoted ventilators are provided with standard push bar ventilator operators, except when other equipment is ordered. We can also furnish with spring catches, with or without



Malleable iron hinge bolted to sill of ventilator.

chains, and when desired can provide mechanical operating devices where the ventilators are in series, or not readily accessible.

Ventilators can also be procured, which are hinged at either top or bottom. These have the same continuous double contact weathering as standard center pivoted ventilators.

In addition to the above types of ventilators we are prepared to supply projected ventilators to open from the head down and out from the sill. These ventilators are equipped with a malleable iron cam locking handle and pole ring and with steel stay bars. Bronze friction ball

blocks and hardened steel balls with screw adjustment are used in the corners of the head of each ventilator.

Where steel sash are intended for use in locations under the jurisdiction of the Fire Underwriters, Underwriter's Labeled Sash, tested, inspected and passed by the Underwriter's Laboratories, Inc., can be made up.

Underwriter's Labeled Sash is glazed with a glazing angle in place of the spring wire glazing clip used on standard industrial sash.

Cambered, splayed and semi-circular head units can be furnished with industrial units. Construction throughout is the same as for standard industrial sash.

Galvanized Sash

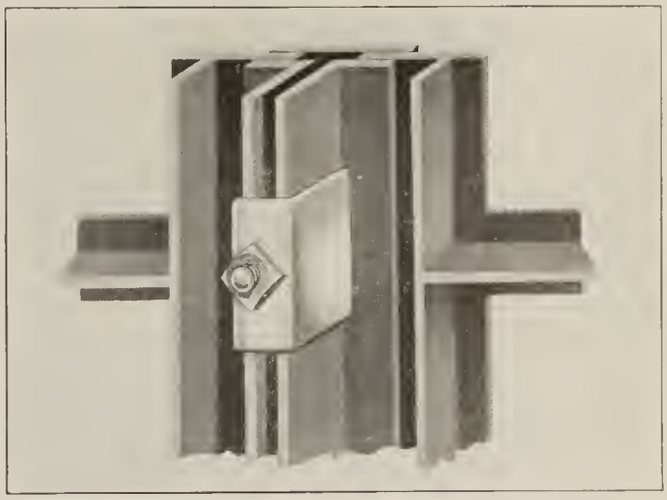
The construction of welded solid steel sash lends itself particularly to uses where a galvanized sash is desirable because of corrosive gases, acids, etc.

Since there are no joints or intersections that can work loose and cause the galvanizing to crack and peel, Febrisco welded solid steel sash is the only satisfactory galvanized sash on the market. Febrisco galvanized sash is made up complete before galvanizing.

We have sold and installed large quantities of this sash at the Union Stock Yards, Chicago, where the need of such sash is readily apparent, and are prepared to supply galvanized sash for all conditions requiring a galvanized product.

Top Hung Continuous Sash

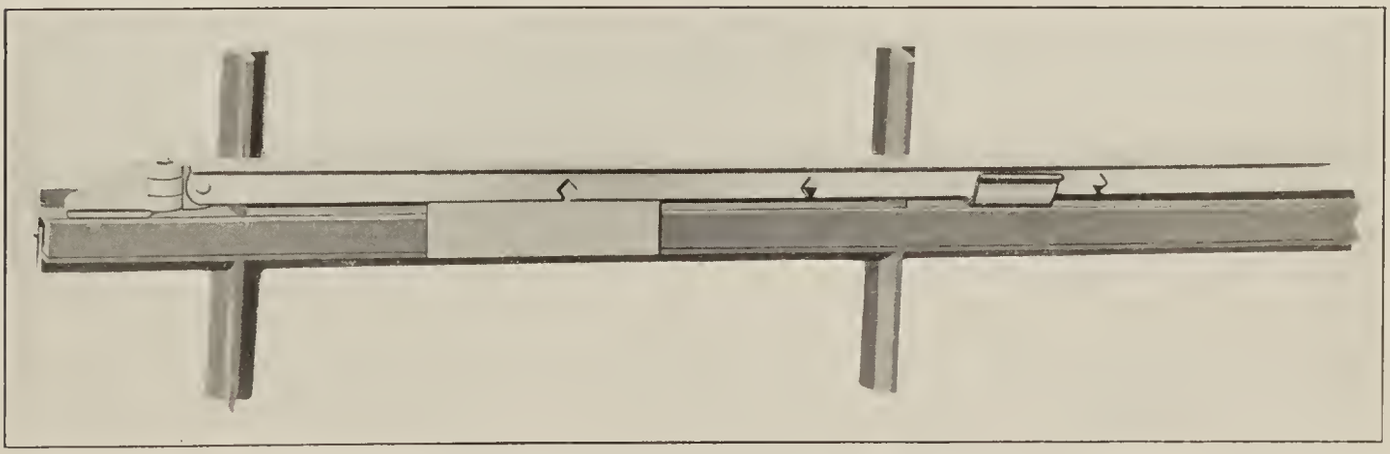
In addition to the types of industrial sash described, we are prepared to furnish top hung continuous sash, with or without mechanical operating devices. Top hung continuous sash are not made in standard units. Each installation is individual to the particular building for which it is intended. We will be glad to furnish detail drawings and prices to meet any requirements.



Mullions make it possible to build up combinations of standard units

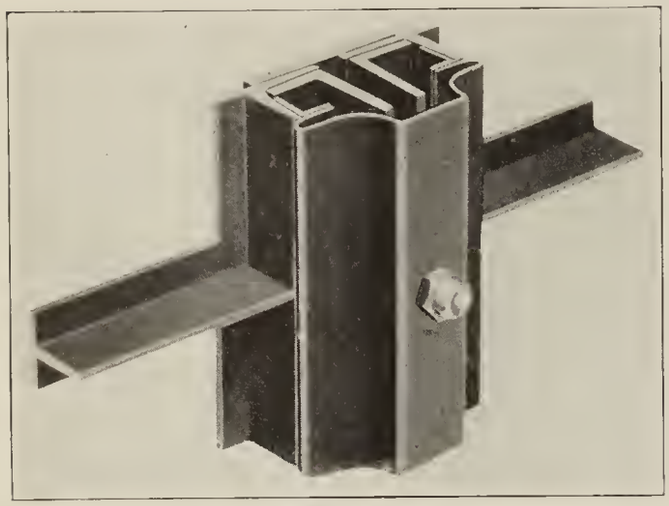
Architectural Sash

Welded solid steel architectural sash are made up for use in public and semi-public buildings, such as hospitals, court houses, schools, libraries, hotels, apartment buildings and similar structures. They have all the advantages of the solid steel industrial sash and at the same time their lines permit the architect to give a pleasing effect to the window openings.



The push bar folds back out of the way, and locks the ventilator.

Ventilators in architectural sash are of the projected type. They can be reversed in position thus bringing the exterior surface to the inside, in which position the entire outside face of the sash can be cleaned from the interior of the building.



Mullion with cover plate.

We will be pleased to send a sash catalog which describes in detail the construction of this type of sash, industrial sash and special types, such as store front and show window sash.

Tubular Steel Doors

We are often called upon to furnish steel doors in combination with steel sash. Febrisco welded tubular steel doors fit well into this line and meet the most exacting requirements. These doors are described in detail in a special catalog. Write for a copy.

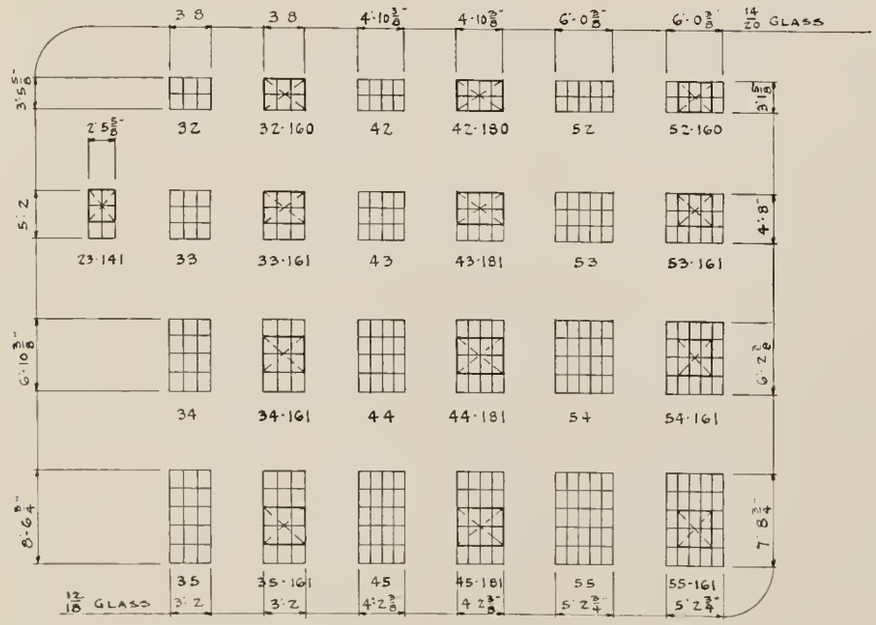
STANDARD SECTIONS

Unit	12 x 18 Glass Size Weight Lbs.	14 x 20 Glass Size Weight Lbs.	Unit	12 x 18 Glass Size Weight Lbs.	14 x 20 Glass Size Weight Lbs.
23-141	43	49	45	66	75
32	25	28	45-181	89	100
32-160	44	50	52	38	43
33	34	39	52-160	57	64
33-161	54	60	53	52	58
34	44	49	53-161	71	80
34-161	63	71	54	66	74
35	53	60	54-161	85	96
35-161	72	82	55	80	90
42	31	35	55-161	99	112
42-180	53	60	2 L Mullion	12	13
43	43	48	3 L Mullion	18	19
43-181	65	74	4 L Mullion	23	25
44	55	61	5 L Mullion	28	31
44-181	77	87			

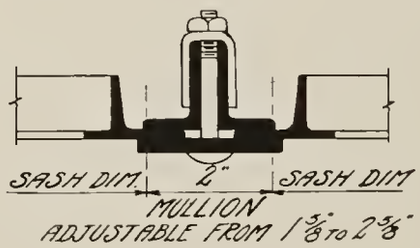
BASEMENT SASH

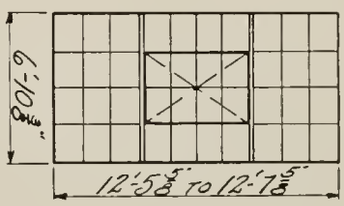
Unit	Glass Size, Inches	Weight, Lbs.	Mullions Weight, Lbs.
3 MA	10 x 12	17	4
3 MB	10 x 16	20	5
3 MC	10 x 20	22	6
2 MD	14 x 20	21	6

PUTTY: Steel Sash Litharge Putty or Standard Glaziers Putty should be used. Figure 1 lb. of putty for each light of glass.



The above units are the most commonly used sizes.



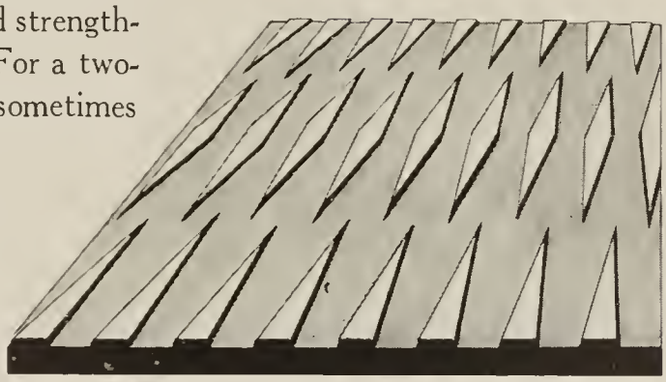


COMPUTING MASONRY OPENINGS

1-Unit 34 14/20	=3'-8"
1-Mullion Bar	=2" (1 5/8" 2 5/8")
1-Unit 44-181 14/20	=4'-10 3/8"
1-Mullion Bar	=2" (1 5/8"-2 5/8")
1-Unit 34 14/20	=3'-8"
TOTAL	=12'-5 3/8" (12'-5 5/8" to 12'-7 5/8")

Firmtread Traffic Plates

THE placing of two lanes of traffic plates about 24″ wide, spaced the normal gauge of vehicles, for the entire length of the bridge directly over the worn planking, eliminates reflooring and strengthens the entire bridge. For a two-way bridge, these are sometimes laid with one lane on each side and one lane in the middle, instead of the regulation four lanes, all depending upon the width of the bridge. Vibration is overcome as well as the chatter and the constant annoyance of rising spikes, so dangerous and detrimental to automobile traffic.



Firmtread plates are rolled from steel. In strength, durability and appearance they are superior to cast iron plates and have the added advantage of weighing and costing less.

The raised diamond type provides a continuous drain for water in all directions, having no pockets in which water can collect and form ice in cold weather.

We recommend coating the under side of the traffic plates with a preservative paint before placing on the bridge. The following specifications may prove helpful.

Thickness—The thickness is measured through the body of the plate exclusive of the raised diamond. We recommend 3/16″ plates, weighing approximately 8¾ pounds to the square foot. For extraordinary conditions ¼″ (11¼ lbs.) and 5/16″ (13¾ lbs.) plates are used.

Width—One-way traffic bridges—two lanes 20″ to 24″ wide each. Two-way traffic bridges—four lanes 20″ to 24″ wide each or two lanes 20″ to 24″ wide each and one middle lane 30″ to 42″ wide, which lane is used by traffic in either direction.

Lengths—Plates approximately 12′ long serve to greatest advantage and are conveniently handled. We can furnish plates up to 20′ long if required. Catalog giving complete information and data will be sent at your request.

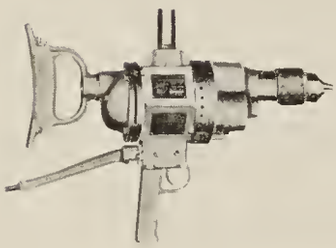
Mason Safety Tread

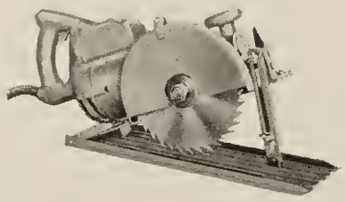
MASON Safety Tread is used for stairways, inclined passages, elevator and door thresholds, sidewalks, platforms, car steps or in any place where there is any danger of slipping. Architects and engineers specify it for state and municipal buildings, business buildings, school houses, colleges, churches, hotels, mills, factories, and private residences. It can be used on wood, iron, slate, marble or granite and presents a neat appearance and is noiseless in use.

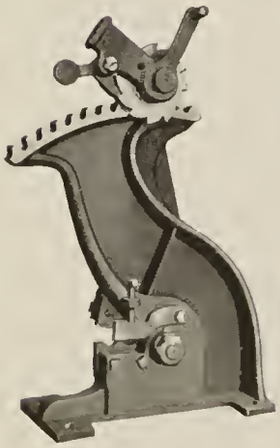
The treads are rolled, unperforated steel, filled with lead or carborundum, which wear equally well. Mason Safety Tread is carried in stock in the following sizes, lead and carborundum filled, 2½″, 3″, 3½″, 4″, 4¾″, 6″. Lengths up to 16 ft. are carried in quantities to meet all regular requirements. 3″ and 3½″ sizes have nosing.

These treads can also be furnished promptly with brass base. We will be glad to mail you a catalog giving complete information, on all Mason Safety Treads.

Tools for the Contractor







PROMPT service on all the hundred and one small tools needed for construction work is another feature of our complete service for contractors and builders.

Through many years of experience in both the use and sale of all kinds of small tools and equipment we have gradually and carefully built up a line in which we have complete confidence. In the list you will find a complete range of tools for every type of metal and wood working. Tools which we confidently back with the Ryerson reputation of more than three-quarters of a century of business.

We have also instituted a purchase plan which makes it easy for the buyer to select this equipment. Our catalog and price supplement give complete information, specifications, net prices, and F. O. B. points. The Ryerson Guarantee protects you as to price and product. So with this complete information and guarantee you may place your orders with assurance that if price or product is not right you may return the shipment without question and your money will be promptly refunded.

If you do not have a copy of the Ryerson Small Tools and Equipment Catalog and current price supplement, write us and we will gladly forward them at once.

The Ryerson Machinery line also includes heavy metal-working equipment and machine tools for the structural shop, machine shop, boiler shop, railroad flue and spring shops, etc. Catalog sent on request.

Partial List of Small Tools

Acetylene Generators
Angle Benders
Angle Notchers
Angle Shears
Anvils
Babbitt Furnaces
Babbitt Ladles
Band Saws, Metal
Bar Benders
Bar Shears
Bench Legs
Benders, Bar
Blacksmith Forges
Blowers, Electric
Bolt Clippers
Boring Tools
Braces, Trench
Bridge Reamers
Calking Tools
Chain Hoists
Clippers, Bolt
Chipping Hammers
Chisels, Hand, Pneumatic
Chucks
Clamps
Cranes and Hoists, Portable
Drills, Electric
Folders
Forges
Furnaces, Bench
Grinders
Hack Saws
Hammers
Hoists
Jacks
Ladles
Lifting Clamps
Locomotive Jacks
Mandrels, Hollow
Notchers, Angle
Pipe Vises
Pneumatic Chisels
Punches and Dies
Ratchet Punches
Ratchet Wrenches
Reamers, Bridge
Rivet Forges
Riveting Hammers
Rivet Cutter, Pneumatic
Rivet Sets, Pneumatic
Rod Cutter
Saw, Portable Electric Hand
Saws, Hack
Screw Drivers, Electric
Serpentine Shears
Shears
Shield, Eye
Snips
Soldering Iron Furnaces
Structural Wrenches
Taps
Tee Shears
Tongs, Rivet
Track Jacks
Trench Braces
Vises
Welding Outfits, Oxy-Acetylene
Wood Saw, Portable Electric

Welding Equipment for Contractors

WELDING is making rapid strides in the building fields and every day finds contractors and builders using it for some new purpose.

We can furnish promptly oxy-acetylene cutting and welding outfits for the many miscellaneous uses to which they are put on the job. Also generators, trucks for cylinders, and all equipment used with this process.

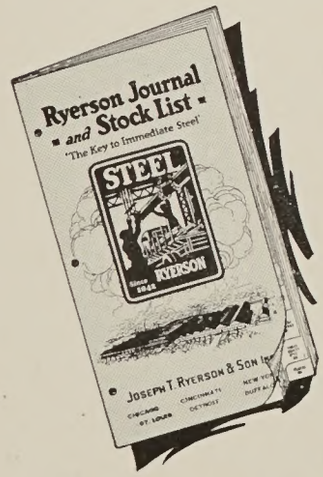
We can also furnish "Stable-Arc" Welders in portable types either electric, gasoline motor or belt driven for erection work, adding metal, repair of equipment, etc. The arc welder is superior for fabrication and many welding jobs, but where a considerable amount of cutting is required we recommend the acetylene sets.

Welding rods of various makes and analysis, made by the leading welding rod specialty mills, are carried in stock for immediate delivery. If you have any question as to which rod is best to use, we will be pleased to give you the benefit of our experience and send samples of any of the various rods for test purposes.

We will be glad to send you complete information on any of this equipment.

General Iron and Steel Products

FOR more than three-quarters of a century Joseph T. Ryerson & Son Inc., has furnished steel for all general building and industrial purposes. It was through this contact in serving the general iron and steel requirements of the construction industry that we first began to build up the specialized steel service to Contractors and Builders.



The "Key" to Immediate Steel

In addition to the many building specialties described on the preceding pages we can always supply from stock the many standard steel products such as plates for mixing boards, sheets for forms and general miscellaneous work, refined iron bars, chain, bolts, nuts, rivets, etc.

Eight huge warehouses, strategically located to serve the various industrial centers, are completely stocked with all kinds of steel products.

More contractors every day are coming to use Ryerson Warehouses as their own storeroom and securing immediate shipment as the work progresses.

Sheets

Plain galvanized sheets for form work, for sleeves and general miscellaneous work can always be shipped immediately from the nearest Ryerson plant. More than twenty kinds of sheets are carried in stock for immediate delivery. All sheets are stored in special heated rooms to preserve their quality and finish.

Plates and Structurals

Ryerson stocks of plates and steel shapes of all kinds are the most complete in the country. All sizes and kinds of plates, beams, channels, angles, tees, zees, etc., are carried in warehouse stock for immediate delivery. Special equipment cuts them to the length or size you need in a few seconds time. See the Ryerson Journal and Stock List for sizes, lengths, etc.

Refined Iron

Lewis Special Refined Iron is especially adaptable for hooks, coupling links, pins, and the many pieces which the contractor makes up on the job.

Lewis iron is ductile and tough, and being pure refined iron will stand the elements better than steel.

Everything in iron and steel is in stock for immediate shipment.

Large quantities of refined iron in both round and square bars are always carried in stock.

Chain

Common twist link chain and log chain are always carried in stock for immediate shipment. We are prepared to supply on very short notice special chain of every description, such as hand welded chain for steam shovel and dredge work, railroad wrecking chain, etc.

In addition to the products already listed in this booklet we carry in stock many other iron and steel products which the contractor needs daily such as—

Babbitt Metal Bands Boat Spikes
Boiler Tubes and Fittings Bolts and Nuts
Eye Bolts
Lag Screws
Lugs Drift Pins
Nails
Patch Bolts
Alloy Steel
Strip Steel
Shafing
Guard Railcable
Square Tubing
Threaded Rods
Tool Steel
Turnbuckles
Washers Wire

The Ryerson Journal and Stock List

The Ryerson Journal and Stock List, known as the "key" to immediate steel, is published in eight separate editions, each listing the stocks of steel products available for immediate delivery in each of the industrial areas served by Ryerson plants.

It gives stock sizes, weights, extras—complete information on all steel products. It also contains 32 pages of trade news, business conditions and articles of general interest.

If you are not already getting the journal we shall be pleased to place your name on our mailing list to receive it regularly.

AVERY CLASSICS